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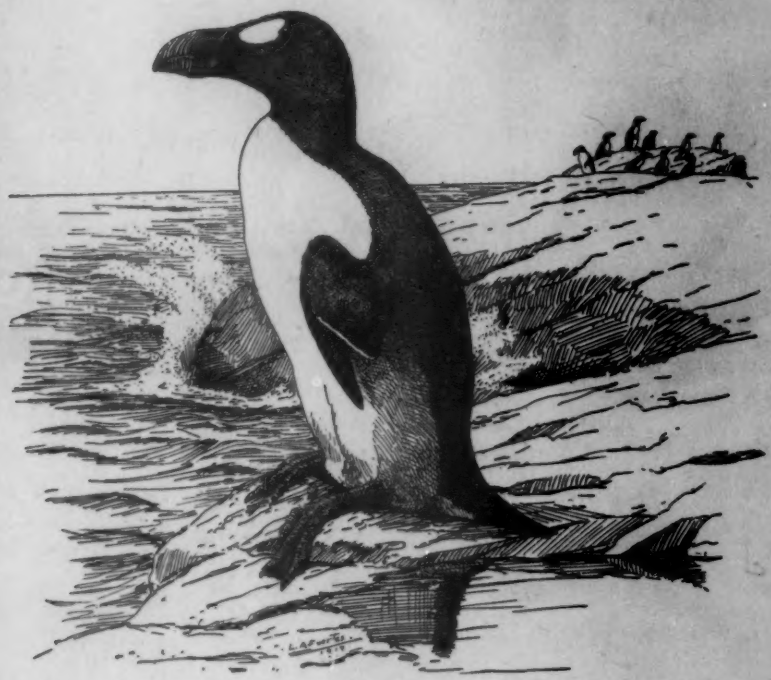

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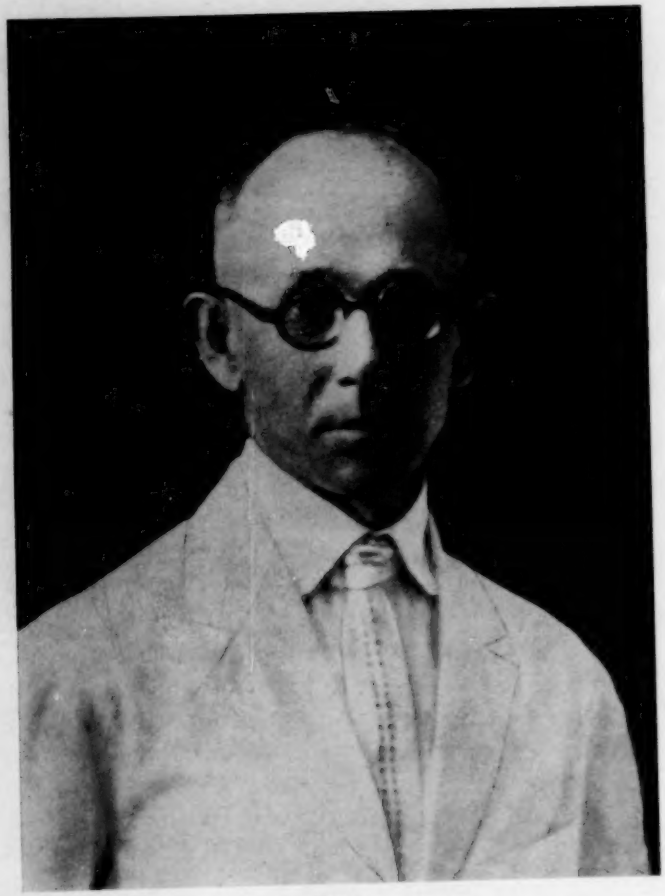

R. C. McGregor

UNIV. OF MICH.

THE AUK

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IN MEMORIAM: RICHARD C. McGREGOR ORNITHOLOGIST OF THE PHILIPPINES

BY JOSEPH GRINNELL

Plate 7

RICHARD Crittenden McGregor was born in Sydney, Australia, on February 24, 1871. He died in Manila, Philippine Islands, December 30, 1936, thus passed sixty-five years of age. At the time of his death he was editor of the 'Philippine Journal of Science' and Chief of the Publicity Division of the Department of Agriculture and Commerce. He had been connected with the Bureau of Science practically continuously since its establishment in 1902, thus over a period of nearly thirty-five years. While during most of this period carrying the title of Ornithologist, he served from time to time also as Acting Director; but he avoided executive advancement, always preferring to expend his outside time and energy in pursuit of his major field of interest, ornithology.

When McGregor was one year old his father was killed in an accident. His mother, Charlotte Crittenden McGregor, had been born in Rochester, New York, in 1841. Until her death shortly after he entered Stanford University, the two were inseparable companions. They had come to California in the 1880's, living first, it seems, at Santa Cruz. Then there was a period of residence in Denver, Colorado, where they lived with his grandfather. There he attended high school, from which he graduated in 1893. At Stanford, according to the Registrar's records, McGregor matriculated in the academic year 1893–94. His attendance was interrupted, for example, by his fish-collecting trip to Panama, in 1896, with a group of Stanford zoologists and by his joining one of the A. W. Anthony expeditions to Lower California in 1897, so that he did not receive his A.B. degree until September, 1898. His degree was received in Philosophy, although he had started out in Zoology. Rumor has it that he and his major professor in the latter subject failed to agree in certain matters; and McGregor had a will of his own! Years later, after his achievements in the Philippines

had become widely recognized, he was accorded an honorary Master's degree.

Happily, a glimpse of an early segment of McGregor's life and an appraisal of his character are available from an authoritative source. Wilfred H. Osgood was one of that earliest group of students who matriculated at the newly founded University at Palo Alto, and he contributes to this biography the following reminiscences of those college years.

"I first met McGregor in 1894 on an opening day in the zoological laboratory of Stanford University. Among strange boys, we came together as if by magnetism. We worked at adjoining tables dissecting earthworms and crayfishes or cutting sections of chick embryos; but any conversation was always of birds and outdoor zoology, with the implication that a course in college zoology was perhaps necessary and important but comparatively no fun. He gave me quite a shock one day when he said bluntly that he cared nothing whatever for science as such, that he liked birds better than anything in the world and that was all there was to it for him. At that time, cytology and embryology were in the ascendancy and experimental zoology and genetics had scarcely begun. However, he didn't quite mean all he said, for he worked with great enthusiasm in the laboratory and easily extended his love for birds to other animals.

"We found as our seniors in the same laboratory two especially congenial spirits in John Van Denburgh and Flora Hartley (Greene). This was at the time the Cooper Ornithological Club was in its infancy, and within a week McGregor was staying the night with me at my home in San José to attend his first meeting. He was slightly older than the rest of us and much more experienced, so he was looked upon as a great acquisition. Largely through him, Walter Bryant, A. W. Anthony, and other still older men became interested in the Club and we began to feel established and confident. Up to that time our small numbers and our consciousness that we were only juvenile egg-collectors gave us a feeling of uncertainty and modesty. We all knew what we wanted to do, but we didn't know how to do it. McGregor then, at just the right time, supplied a good deal which none of the rest of us had. Already he was an accomplished bird-skinner and had a considerable private collection of skins, including many species from Colorado and Florida which were unfamiliar to us. Both he and Bryant gave us instruction in making skins and, thereafter, a number of us definitely graduated from the egg-collecting stage of our careers.

"As a young man, McGregor was fun-loving and was endowed with those intangible qualities usually summarized as charm. Everybody 'liked' him. At my home in San José, where he was a frequent visitor, he was called 'Little Mac' or 'Dickie' by members of my family, who usually referred to my other friends derisively as 'those bird-eggers.' At one of the San José

meetings of the Cooper Club I remember that McGregor was missed about midway of the program. Having heard some suspicious sounds, I threw open a door leading to an adjoining room, when the whole meeting was greatly amused to see him in there gaily dancing with my oldest sister.

"Just before I knew him, McGregor had been living with his widowed mother in a most charming relation in which he collected and studied birds while she occupied herself in exercising a talent for painting. In a few instances she made small ornithological drawings for him. They were devoted to each other and moved about somewhat, from Florida to Santa Cruz, California, and then to Colorado; and when he came to Stanford she came with him, but she passed away soon after. I don't remember mention of his father, but I met his mother who impressed me as a very frail but charming and cultivated woman. In Colorado, he seems to have been acquainted with most of the ornithologists of that State, and I remember his speaking warmly of Fred Dille, C. E. Aiken, W. G. Smith, and others.

"The only collecting trip I remember taking with McGregor was to Pine Ridge, in the Coast Range southeast of San José, where he was to collect birds and fishes while I trapped for small mammals. It was an ill-fated expedition in which a balky horse, an overturned buggy, and poor collecting conditions were features, but it served as the subject of many a quip in later days. He had a delicate sense of humor and was always a delightful companion. He was given to strong attachments in which he displayed more downright affection than is usual with boys. He never gave up a friend, but always had someone who took a particular place. For a time he and I were almost inseparable. Then he was intimate with John Van Denburgh and then with Theodore Hoover."

As recording the friendship last alluded to by Dr. Osgood, we have in our check-list of Californian birds, *Dendroica coronata hooveri* McGregor, a western race of the Myrtle Warbler.

The results of McGregor's early collecting, in Colorado, various parts of California, in Lower California, Hawaii and Alaska, are now widely distributed through the major museums of America. The type specimens of the new birds he named from America he wisely at once placed on deposit in the U. S. National Museum; thence, ultimately, they went to the American Museum of Natural History. Already in the late 1890's, McGregor had decided to specialize on the fringillids. Representatives of other families that he collected, he exchanged for fringillids, sold, or gave away to interested bird students. Eventually, after becoming thoroughly established in the Philippines, McGregor sold his American collection of 2500 skins, nearly all finches, to Jonathan Dwight, Jr. This transaction took place in March, 1913. The collection had been stored in Palo Alto, and McGregor asked me to see to its packing and shipment, which I did, send-

ing Charles D. Holliger down from Berkeley to do the job. The Dwight birds are now, of course, part of the great collection at the American Museum. Only one, I think, of McGregor's types is not now in New York City,—that of the non-fringillid, *Dendroica coronata hooveri*, which was presented to Theodore J. Hoover and went with the latter's collection by gift to the California Academy of Sciences.

McGregor's summer-time trips to Alaska in 1900 and 1901 were made when attached to the U.S.S. 'Pathfinder.' After the second of these seasons this famous 'cutter' was ordered to proceed to Manila, from which it has never returned. On the way, between Japan and the Philippines, a *Calliope* flew aboard, and McGregor collected and stuffed it. As soon as he got to Manila, he took the bird to Dean C. Worcester, whose well-known interest in ornithology prompted quick action on his part in employing McGregor as collector. At first, the latter worked in a small house in the rear of Worcester's house. David P. Barrows was then Chief of the Bureau of Ethnology and took interest in McGregor's advancement in position and equipment, so that before long he was well established. [For this bit of his early Philippine history, gotten from McGregor himself in 1930, I am indebted to Major L. L. Gardner.]

McGregor was an excellent correspondent. I prize highly my long series of letters from him, beginning in 1897. The extreme accuracy he observed in all matters relating to his ornithology and to his editorial vocation extended to his own handwriting. The letters may be read as effortlessly as one reads pages of clear typewriting.

The idea of incorporating the Cooper Ornithological Club was in the air as long ago as 1901. McGregor writes under date February 23, that he will bring a lawyer friend to the next meeting, and urges that I "bring Hoover if you can snare him." After the death of Chester Barlow in November, 1902, deeply mourned by McGregor in common with all others who had enjoyed his cheerful companionship, the latter writes: "We will miss him indeed. Save the 'Condor' if you can. It was Barlow's great interest and it would be a pity that it go under. . . . There is such a dead load of work that doesn't show. If I were there I would be into it with both feet. I send you and Fisher my very best wishes. . . ."

McGregor returned to California late in 1905, in part "to do a little fish work for Dr. Jordan." But by February 11, 1906, he was on his way back to Manila, to resume his official and ornithological work there. By August 27 of the latter year he had visited the island of Bohol, finishing "a very satisfactory job" there and getting "about 140 species where there were only 55 recorded before." But once in a while nostalgia gets him. "I would like to see a Cactus Wren or a Road-runner. These birds here are mostly so wrong I feel uncomfortable." "I don't enjoy these birds near as

much as I would a good bunch of sparrows" (September 15, 1907). Yet, on another occasion (1911), he writes that "they [friends] once offered to try to get me a place in the Brooklyn Museum under Lucas. I like Lucas and it would be fine to be near Washington, Philadelphia, etc.; but I am too long wild; I like to get into new places. Think of the unexplored parts of the Philippine Islands, and the ripe, juicy regions near-by! No U. S. for me. . . ."

The American Ornithologists' Union at its annual meeting in December, 1907, elected McGregor a Fellow of that organization. With characteristic self-depreciation, he wrote me under date March 8, 1908: "I received my notice from [Secretary John H.] Sage before your letter came. . . . It was a great surprise to me and I still wonder at the action, particularly as I am practically out of the American field. . . . I am greatly pleased, as it shows I must have some good friends in the A. O. U."

On the A. O. U. 'Check-list,' *Carpodacus mcgregori* Anthony, from San Benito Islands, Lower California, commemorates his name and also the fact of his visiting that part of Mexico in 1897 in company of A. W. Anthony and Henry B. Kaeding. Incidentally, a marine fish from Panama is named *Halichaeres macgregori* Gilbert and Starks.

In his various letters from Manila, McGregor shows that he is keeping track as best he may with "questions of the day." In 1902 he says: "I wonder what Sharpe and others across the water will say when they see your list with *Tyrannus tyrannus tyrannus*. . . . They certainly don't understand subspecies as we do. I mean their ideas are different."

In 1916, he is concerned over trends in economic ornithology. He is undertaking some local work in that field himself, and is not sure of its worthiness. "I think that the whole trouble is that the problem is too complex; with few exceptions, I don't believe the information [from stomach examinations] regarding a given species can be made of practical use. If a man steals a ham we jug him, no matter how much good he may do on the other 364 days of the year. If we dealt with birds . . . in the same way there would be some use in proving that they eat cultivated grain or fruit. But it can't be handled that way. . . ."

In 1919, McGregor writes: "I am glad to see you attack the monotypic genus idea as exhibited in its most rabid form by Mathews. I am willing to split species to any extent they can be used, but I can see no use in further division of genera. . . ." In the same year he argues strongly for giving up the trinomial altogether—employing the purely binomial construction of name for all forms recognizable at all.

Ornithologically inclined visitors to the Philippines were always warmly and helpfully welcomed by McGregor; testimony to this effect is afforded in my correspondence with a number of people. And McGregor, in turn, se-

questered most of the time as he was, from ornithological contacts, greatly valued such visits. Under date October 29, 1926, he writes: "Dr. Casey Wood has been here for nearly a month. I am enjoying him very much." On September 9, 1927: "I am having lots of fun here with Capt. [now Major] L. L. Gardner; we get out twice a month, the only two Sundays that he is off duty." And again (October 29, 1929): "I am pleased to be a co-author with Gardner because I think a lot of him and he is going a long way." Captain L. R. Wolfe was another American whose sojourn in the Philippines meant much to McGregor.

It was my fortune, on August 23, 1927, to write a letter introducing The Marquess Hachisuka to McGregor. This was on the eve of Hachisuka's first visit to the Philippines, a visit which initiated his deep interest in the avifauna of the archipelago; and there eventually resulted Hachisuka's admirably illustrated, four-volume work, 'The Birds of the Philippine Islands.' In Part I, in course of a historical review of the ornithology of the islands, Hachisuka renders full praise to McGregor on score of the fundamental soundness of the latter's systematic work as well as on other scores. Incidentally, Hachisuka finds that McGregor named thirty-nine new kinds of Philippine birds; of these, four forms are now rated as full species. Also, he named two new genera. *Edolisoma mcgregori* (Mearns) from Mindanao was named after him.

In his official work in the Philippine Bureau of Science, McGregor became more and more closely occupied with the editorial function. Latterly he was managing editor of the 'Journal' as well as informally editor of many less regular contributions from the Bureau. And with many contributors not superiorly qualified to write in the English language, this must have been an extraordinary chore! On June 13, 1923, he writes me: "I haven't looked at a bird for years, it seems, as there is always some MS. that needs to be combed." His official associate, Eduardo R. Alvarado, writes (Memorial Supplement to 'The Philippine Journal of Science,' vol. 62, 1937): "I had the privilege of working with him for the last four years, and during this intimate association I have come to realize that a man can be great without the pomposity and popular acclaim that generally accompany modern greatness. For McGregor was great in his own modest and unobtrusive way. . . . He devoted the last half of his life to a field of human endeavor not appreciated and almost unknown in this country—scientific journalism. . . . Every page of the 'Journal' bears the stamp of McGregorian simplicity, thoroughness, scientific accuracy, and painstaking labor." Combined with these essential qualities of an editor, so well defined by Alvarado, were still rarer qualities: "Human understanding in dealing with his co-workers; keen sense of modesty; . . . serenity, fortitude and sense of humor under adversity."

Under date July 20, 1903, McGregor wrote me: "Dr. Jordan once said that mediocre men went into places where the standard was lower than where they failed, and found their place. I guess that's me." A wisely prophetic comment, as his career unfolded itself.

I have experienced much difficulty in obtaining a photograph of McGregor to go with the present memorial. Major Gardner tells me that he very much doubts that McGregor had ever had any formal photograph taken of himself, at least he had not in the last twenty years. This again illustrates the tendency in the man to avoid publicity. The picture presented as part of the present memorial is the best one I have seen out of numerous snapshots taken by friends. It was furnished me by Professor Canuto G. Manuel of Manila, who had it enlarged from a group photograph taken more than fifteen years ago.

Of McGregor's long series of published contributions as catalogued at the end of this memorial, the one most widely valued and constantly used not only in the Philippines but no doubt in museums all over the world, is his 'Manual of Philippine Birds.' As The Marquess Hachisuka says (Ibis, April, p. 419, 1937), this at once (1909) became the basis for all subsequent study of the Islands' ornithology. Its lasting authority rested in part upon the exhaustive collections McGregor and his native assistants had industriously and discriminatingly gathered during the preceding eight years since his first arrival in Manila.

Indicative of an irrepressibly active mind, a huge amount of mental labor is represented in McGregor's 'Index to the Genera of Birds,' published in 1920. This is, of course, of world scope, and in its 180 octavo pages there are included 8839 names and some 24,000 references. Meticulous accuracy is a proven quality of this contribution. "W. S." reviews it in 'The Auk' (vol. 37, p. 471, 1920) and says: "A recent letter from the author states that his editorial duties seriously interfere with his ornithological research work, but if his time and opportunities permit only of the preparation of such valuable compilations as the one before us he need have no fear of being charged with neglecting his favorite science. Anyone who has had experience with the dreary monotony of compiling a list or index will fully appreciate the labor involved in Mr. McGregor's modest publication and will recognize the indebtedness that all those interested in systematic ornithology must feel toward him for his helpful work. McGregor's 'Index' will henceforth take the place of the familiar 'Waterhouse' ['Index Generum Avium,' 1889], and the fact that a publication of this sort bears the imprint of Manila is a tribute to the good judgment of those who direct the Philippine Bureau of Science." In this nomenclatorial work of his, McGregor through correspondence received much important help from the late Charles W. Richmond, at that time America's foremost authority in that

troublesome province of research. On October 14, 1920, the former writes me: "I have just received a very kind letter from Doctor Richmond. . . . I hope some day that I can meet him and tell him in person how much I appreciate the help he has given me."

The appended bibliography of 137 titles has been gathered by the present writer first-hand; each and every item has been taken by him from the original source, with pains for accuracy. But it is unsafe to claim completeness in such an undertaking. Moreover, rumor has it that McGregor left at least one unpublished manuscript, likely yet to be printed in Manila. It will be seen that a period of forty-five years was covered; the titles and citations give a pretty definite idea of McGregor's trends of interest and the theaters of his activities during that long period. It is clear that his college training at Stanford where systematic zoology was then fostered, and his few years of field work and writing concerning west-American birds in an arena where rivalries were keen and wits thereby sharpened, all together gave him the best possible background from which to launch work in an entirely new region. Arriving in the Philippines, with then modern methods and ideas at his command, with ability to plan long-time productive programs of exploration, and with tireless resolve to put these programs through to completion, McGregor found his niche and occupied it with almost unique success. From first to last, Richard McGregor was consistently an ornithologist. And the essential segment of world ornithology which he contributed pertained to the Philippine Islands. Ever will his name and that of this region be associated in the annals of natural science.

NOTE.—In assembling materials for this memorial, I had available an abundance of correspondence, which my wife, Hilda Wood Grinnell, went through and abstracted for me. Then I had essential helps from McGregor's junior colleague in the Philippines, Professor Canuto G. Manuel, and from The Marquess Hachisuka whose own work in those islands gives him authority to speak in technical matters. Additionally, I received very much in the way of reminiscence from Major Leon L. Gardner, Captain Lloyd R. Wolfe and Doctor Wilfred H. Osgood.—J. G.

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Museum of Vertebrate Zoology
University of California
Berkeley, California

NESTING OF VIRGINIA'S WARBLER

BY ALFRED M. BAILEY AND ROBERT J. NIEDRACH

Plate 8

THE summer home of Virginia's Warbler (*Vermivora virginiae*) in the eastern portion of Colorado seems to be restricted to the Transition Zone. In the early spring when they first arrive from the south, they may be found along the cottonwood creek-bottoms of the prairies in company with other migrants, but after the first leaves of the scrub oaks appear, they are seldom found away from their favorite habitat. In the broken prairie where the yellow pines have taken their stand upon the crest of the tableland, and in the rocky canyons clothed with the scraggly scrub oaks slipping down to narrow grass-grown creek-bottoms, Virginia's Warbler chooses its nesting grounds.

Plants seem to burst into life during the early weeks in May. The worn limestone and conglomerate boulders have long been jutting out from among the gaunt bare areas of tangled scrub oaks, whose dead leaves of the year before still rustle with every breeze. The walls of the valleys are gray-brown; only the male Spurred Towhees sing from the tips of these shrub-like trees, while the inconspicuous Virginia's Warblers seem to have faith that better times are coming. But warm rains and Colorado sunshine perform miracles overnight. The flowers of the scrub oaks tinge the hillsides with a greenish-yellow bloom; the green of bursting leaves and grasses soon blends with the nodding blossoms of the pasque-flower; the beautiful pink plume sways on the hillside, and yellow blossoms of the Oregon grape thrust forth among the holly-like leaves, making one think of flowering Christmas wreaths. It is then that the Virginia's Warblers are at the height of their activity. Their colors are the grays and yellows of the new vegetation. The males perch among scrub-oak branches and yellow pines, where they are usually concealed, and do their utmost to outsing their towhee neighbors. Their song is much like that of the Yellow Warbler. The females seem to pay scant attention for they are busily engaged in gathering root fibers to line their nesting cavities. It is fairly easy to discover a nesting site at this time, for vegetation is still dwarfed, and the birds may be watched from a distance as they carry material to build their ground nest among the roots of the scraggly growth. In a few days' time the nest is completely concealed by fast-growing vegetation, and then it is a fortunate person, indeed, who discovers the eggs of this secretive little warbler.

We have known Virginia's Warbler for many years and have liked to roam along the broken canyon walls searching for it, but we have found very few nests. Spring comes with such rapidity that before one is aware,

it is too late to watch the warblers at their construction work. Although it is such a common bird, we have found but one set of eggs, beautiful white ones with a ring of chestnut dots upon the larger end. We have had to be content, for the most part, in watching the adults, and listening to them scold, as the constant monotonous *chitting* of the pair most concerned is passed on by other pairs in the same canyon. It is surprising how difficult they are to see, even when close at hand, as their dull-gray feathers blend with the shadows. When the observer is content to rest and watch, hoping the birds will reveal a nesting site near at hand, they seem equally content to sit and watch, and in the end it is usually the bird that has the most patience. Later, however, after the young are hatched, the photographer is more likely to find a nest, for the adults are busy at all hours carrying the large caterpillars that feed upon the leaves of the scrub oaks. The hatching time of many species of Colorado birds seems to coincide with an abundance of larvae feeding upon plants among which the birds are nesting. We have noticed time and again, that pests are numerous upon the vegetation when fledglings are in the nest, but a few weeks later, after the little fellows have taken wing and are able to move to other parts, the caterpillars have gone into the pupa stage. Probably this is just a coincidence, but we have often commented upon it. Be that as it may, a warbler with beak crammed with wriggling larvae is evidence enough that a nest is somewhere in the near vicinity, and a bird dropping into a tangled growth will usually reveal its location.

Again, when one is prowling along brushy hillsides with other affairs in mind, he will sometimes flush incubating birds under foot. The first family we photographed was found in such a manner on June 5, 1935. The female continued to brood her small young until a descending foot brushed the entrance to her nesting depression; there was a little call of alarm and a flutter of wings as she departed, revealing the site, and we had our first opportunity to film a Virginia's Warbler. As the location of the nest was not suitable for the erection of a photographer's blind, we fastened our motion-camera within four feet of the young, concealed it with green oak leaves and worked the shutter with a string. We reclined thirty feet away and watched our adults with glasses; they were concerned, and scolded continuously, but did not drop a caterpillar during the process. The male would cease his scolding occasionally to give his song, flashing his tail sidewise in characteristic manner. Finally the female worked her way to the ground by a circuitous route and with one eye on us, slowly approached the nest. As she came within the field of the camera, we pulled the string but at the first movement of the film, she sprang into the air. It was only after many attempts, with long intermissions, that we finally made a picture record of our quiet-colored, nervous little warbler feeding her young.

This past season, while photographing a Cooper's Hawk, from a blind high in a yellow pine, we enjoyed the spring song of the Virginia's Warblers. They seem to revel in singing late into the season. The second week in June we saw a pair of birds carrying caterpillars and so, whenever our hawks were away from their nest, we watched the dense thickets for our warblers. On the 17th the young were large enough to keep the adults busy, and we finally located the nesting cavity among the roots of a scrub oak. It was beautifully concealed and contained four young birds all dressed to go into the world. They were fully feathered and closely resembled the female; we realized the youngsters would probably leave the nest if disturbed, so we erected a blind with as little commotion as possible, tied the branches aside to allow light to filter in, and hoped the warblers would take kindly to our hiding-place. It did not take the female long to become accustomed to the blind for within twenty minutes she was hanging head down from a small branch, passing caterpillars to eager youngsters. But she flushed when the camera was started and refused to come to the nest during the next two hours, although she sat within a few feet, continuously *chitting* as she eyed the shelter.

The blind was left overnight and the warblers seemed well satisfied the next morning for they came readily to feed their large young. We observed them for some time without attempting to make photographs and found that both adults shared the work, averaging a trip every six minutes. But when we tried to take motion-film they objected; they were dignified about their scolding, but were persistent in their refusal to pose near the nest. They showed plainly that they realized someone was concealed behind the canvas. Occasionally one would dart in and drop a wriggling caterpillar into a wide-open mouth, but the performance was always too fast to make a satisfactory motion-film. We had to be satisfied with still shots—rather poor ones to be sure, for the intense light overexposed the vegetation about the nest and we could not hope to cut into the deep shadows. The young were taken from their nest and held in hand that we might have a pictorial record of our visit. The adults did not take kindly to our efforts; they scolded and darted near, occasionally fluttering to the ground with outstretched wings and piteous cries, feigning injury as do many other birds. Our young birds were not friendly and posed under protest. When replaced in their nest, they promptly took wing, following their anxious parents down the brush-covered hillside. Our efforts to secure a photographic story were none too successful, but at least we had had a chance to visit this common, but little-known warbler and had learned something of its housekeeping among the Colorado scrub oaks.

Colorado Museum of Natural History
Denver, Colorado

HABITAT OF VIRGINIA'S WARBLER

VIRGINIA'S WARBLER AT THE NEST

UNIV. OF MICH.

SYSTEMATIC POSITION OF THE GENUS *CICCABA* WAGLER

BY JAMES L. PETERS

DURING the preparation of the manuscript covering the Strigiformes for the next (fourth) volume of my 'Checklist,' some delay has ensued by reason of the large amount of compilation and the very little original research during the last fifty or seventy-five years on this interesting and difficult group of birds. It has been necessary to take an entirely fresh start; to see what generic characters of value could be used in place of the greatly overvalued characters of feathering on toes and tarsi; to examine the ear structure of all the recognized genera and of practically all the species in an effort to check up their systematic position by means of the very valuable but generally disregarded external ear characters. Naturally many instances have turned up of species in the wrong genus and even of genera in wrong subfamilies. Since the present paper deals with the result of my studies of the genera *Ciccaba* and *Strix*, which, as will presently be shown, belong in different subfamilies it may be well to give a brief review of the subfamily concepts with references to pertinent literature.

Considering the Barn Owls as constituting a distinct family, Tytonidae, we find the true owls, Strigidae, made up of two subfamilies, Buboninae and Striginae, separated on the basis of the structure of the external ear. In the second volume of the 'Catalogue of Birds in the British Museum,' 1875, page 2, Sharpe defined the subfamilies as follows:—

> "*a* Ear conch not larger than the eye, without an operculum; facial disc unequal, the portion below the eye being always much greater than the area above the latter . . . . . Buboninae.
>
> "*b* Ear conch much larger than the eye, with very large operculum shutting in the ear; facial disc always distinct and extending as far above the eye as it does below it . . . . . Syrniinae" [= Striginae].

Coues ('Key to North American Birds,' ed. 2, pp. 502–503, 1884) indicated that it might prove advisable to make the features pointed out by Sharpe the basis of two subfamilies, but was not inclined to do so himself at that time; in the fifth edition of his 'Key' which appeared in 1903, however, he definitely accepted the two subfamilies in question.

In the first volume of the 'Hand-list of Birds' (1899, pp. 280–300) Sharpe divided the Bubonidae (i.e., Strigidae) into no less than six subfamilies, basing his arrangement chiefly on a paper by Pycraft that appeared in the Transactions of the Linnean Society of London, (2), Zool., **7**: pp. 223–275, pls. 24–29, 1898. In this paper Pycraft chiefly made use of the pterylosis of some twenty species available to him in preparing a key and systematic sequence of nine or ten genera of "Asionidae;" he did not go below the

family in his classification, but Sharpe, a year later, following Pycraft's general outline, interpolated the genera that Pycraft did not deal with, in the places where he thought they should go and then divided the whole into six subfamilies. This arrangement produced such strange bed-fellows as *Nyctala* and *Surnia* in the same subfamily, and *Asio* separated from its nearest relations by a dozen or more genera to which it is not related.

Ridgway (Bull. U. S. Nat. Mus., no. 50, pt. 6, pp. 619–622, 1914) thus analyzed the two subfamilies in the "Key to the American genera of Bubonidae":

> "*a* External ear-opening extremely large, its vertical axis equal to at least half the greatest height of skull, crossed by a median ligament or bridge, its margin (at least the anterior one) produced into a dermal flap of greater or less width.
>
> "*aa* External ear-opening relatively small, its vertical axis much less than half of the greatest height of skull, not crossed by a ligamentous bridge nor with margin developed into a dermal flap."

Ridgway did not actually differentiate the two major subdivisions as subfamilies, in his key, but since he was not given to recognizing subfamilies, this is of no great importance, since his main heads coincide with the subfamily limits, so far as American owls go, as laid down by Sharpe.

The best account of the external ear and cranium of owls, as exemplified in certain holarctic genera and palaearctic species (*Surnia, Nyctea*; *Bubo bubo, Asio flammeus, A. otus, Strix aluco, S. uralense, S. lapponica, Aegolius tengmalmi* and *Glaucidium passerinum*), is by Collett (Forh. Vidensk.-Selsk. Christiania, 1881, no. 3, pp. 1–38, pls. 1–3); an English translation, edited by Shufeldt, appeared in 'Journal of Morphology,' **18**, pp. 119–176, pls. 15–20, 1900. Professor Collett's paper, originally published in Norwegian, is a most valuable contribution and it is a source of regret that its scope is not wider; ornithologists owe a debt to the memory of Dr. Shufeldt for rendering it more generally available.

With these preliminary remarks I pass now to the chief purpose of this paper: the systematic position of the genus *Ciccaba* and remarks on certain other species of owls. In 1932, Leon Kelso published a privately printed brochure of forty-seven pages entitled 'A synopsis of the American Wood Owls of the genus *Ciccaba*' (Lancaster, Pennsylvania; The Intelligencer Printing Co.). In this publication he has brought up to date the nomenclature, description, synonymy and ranges of this group of tropical American owls. For the history of the development of the genus *Ciccaba*, which was originally established by Johannes Wagler in Oken's 'Isis,' 1832, column 1222, with *Strix huhula* Daudin, as its monotypic type, one must go back to Bonaparte (Rev. et Mag. Zool., (2), **6**: 541, 1854); Sclater and Salvin ('Nomenclator Avium Neotropicalium,' 1873); Sharpe ('Catalogue of Birds in the British Museum,' **2**, 1875); Stone (Proc. Acad. Nat. Sci. Philadelphia,

1890, p. 126); Sharpe ('Hand-list,' 1: 295, 1899); Brabourne and Chubb ('Birds of South America,' pp. 76–77, 1912); and Ridgway (Bull. U. S. Nat. Mus., no. 50, pt. 6, pp. 759–768, 1914), and in addition the many shorter papers dealing with the owls of Central and tropical South America. Delving thus into the works of the past, one can get an idea of the original conception of the genus, its temporary eclipse through 'lumping' with *Syrnium* (now known as *Strix*); its reinstatement; a species added here, one removed there; new species or subspecies described, or old ones synonymized; until the net result is that presented by Kelso.

Since this work may not be generally available, I give here a brief synopsis which will also serve as a convenient reference.

Genus CICCABA Wagler

Subgenus *Ciccaba*

Ciccaba huhula (Daudin)
Ciccaba nigrolineata (Sclater)

Subgenus *Macabra* Bonaparte[1]

Ciccaba hylophila
Ciccaba albitarsus albitarsus
Ciccaba albitarsus goodfellowi
Ciccaba superciliaris superciliaris
Ciccaba superciliaris macconnelli
Ciccaba virgata centralis
Ciccaba virgata squamatula
Ciccaba virgata tamaulipensis
Ciccaba virgata virgata
Ciccaba suinda

Subgenus *Pseudociccaba* Kelso

Ciccaba aequatorialis
Ciccaba albogularis albogularis
Ciccaba albogularis meridensis

There have long been two danger signals flying that must be heeded before *Ciccaba* can be fitted into its proper systematic position. In 1875, Sharpe regarded as congeneric with *Syrnium*, all the species now referred to *Ciccaba*, placing *Syrnium* in the subfamily Syrniinae (what is now known as the Striginae). In 1914, Ridgway placed *Ciccaba* (his diagnosis apparently drawn only from the Central American forms) in the subfamily Buboninae. Thus the general conception of the genus *Ciccaba* has come to mean merely a moderate-sized tropical American owl with feathered tarsi, bare toes and no well-developed or prominent ear tufts, all this in spite of the conflicting statements as to the systematic position of the genus that might well have

[1] Kelso later found that the type of *Macabra* Bonaparte is *Syrnium macabrum* Bonaparte (= *Syrnium albogulare* Cassin) by tautonymy and proposed *Tacitathena* as a new subgenus with *Strix hylophila* Temminck as type.

aroused the suspicion that several quite unrelated species were included in it.

I have been able to examine the external ear structure of all the species commonly referred to *Ciccaba*, as well as that of all the other genera and many of the species of owls. While it is extremely easy when handling an owl in the flesh or as a well-prepared alcoholic, to examine the external ear structure and decide whether the specimen is bubonine or strigine, it is difficult even to find the ear opening in some skins; in other cases distortion in drying or damage in preparation renders an investigation of the structure unsatisfactory. The much more complex structure of the external ear in the Striginae is particularly susceptible to damage during preparation. In the absence of suitable fresh or alcoholic material, I have examined a considerable number of skins, selecting those that showed the external ear structure satisfactorily. Thus when a suitable series of any given species was found to possess only a simple small ear orifice, it has been assumed that the species was surely bubonine, and when another species uniformly possessed a large ear opening with the dermal flap demonstrable, I felt safe in assuming strigine relationships. This rather protracted examination has shown that *hylophila* must be removed from the genus *Ciccaba* altogether; it is not a *Ciccaba* at all, but a member of the genus *Strix*. The three specimens of this rare owl that I have been privileged to examine were loaned through the courtesy of the American Museum of Natural History. All three show clearly the large asymmetrical ear openings, with anterior dermal flaps just as in *Strix aluco*, *S. varia*, *S. occidentalis* and *S. fulvescens*, and I have not the slightest hesitation about removing it to *Strix*. *Tacitathena* Kelso and Kelso (Biol. Leafl., no. 7, January 15, 1937), which was erected as a subgenus with *Strix hylophila* Temminck as type, must henceforth be cited in the synonymy of *Strix* Linnaeus, unless a separation from that genus can be made.

Examination of the remaining forms has shown that all of them are bubonine, though not all are congeneric. *C. albogularis* and *C. aequatorialis* agree with *Ciccaba* in having bare toes, but here the resemblance ceases. Both birds have the distal portion of the tarsus bare as in certain neotropical species of *Otus*, both have a pair of short, rounded ear tufts partly concealed by the long, lax plumage of the head, and both have the frontal bristles much developed, reaching to the tip of the bill or beyond; furthermore the external ear openings are very small, simple and practically symmetrical. In all these respects both *albogularis* and *aequatorialis* agree with *Otus*, particularly with *O. vermiculatus*, and I have no hesitation in removing both these birds to *Otus*, placing them next to *O. vermiculatus*. Carriker (Proc. Acad. Nat. Sci. Philadelphia, **87**: 313, 1935) named *Ciccaba minima* from Bolivia. While I have not examined his type, from the fact that Mr. Zimmer showed me a specimen in the American Museum agreeing with

Carriker's original description in which he states that the nearest ally of *minima* is *C. aequatorialis* and notes the resemblance to *Otus*, it would seem that Carriker's new species also can be safely transferred to that genus, and need not be considered further in connection with *Ciccaba*. Furthermore, both *aequatorialis* and *albogularis* should be regarded as conspecific, so the forms will stand:

Otus albogularis meridensis (Chapman)
Otus albogularis albogularis (Cassin)
Otus albogularis aequatorialis (Chapman)
Otus minima (Carriker)

In his 'Synopsis,' Kelso proposed the subgenus *Pseudociccaba*, type, by original designation, *albogularis*, but this name must henceforward be considered in the synonymy of *Otus*. *Macabra* was proposed by Bonaparte in 1854 and its type was subsequently designated by Gray as *hylophila*, the first species mentioned. It transpires, however, that another one of the species originally included in *Macabra* was *Syrnium albogulare* Cassin, a synonym of which is *Syrnium macabrum* Bonaparte, 1850, hence the latter is automatically the tautonymic type of *Macabra*, since Gray's designation is invalid under those circumstances. *Macabra*, too, must therefore go into the synonymy of *Otus*.

The following species now remain in *Ciccaba: huhula, nigrolineata, albitarsus, superciliaris, virgata* and *suinda*. These form a group, alike in external characters though of rather diverse color pattern, which may be defined as moderate-sized bubonine owls, having an external ear opening of relatively larger size than in owls of similar dimensions in that subfamily, these openings slightly asymmetrical with the larger orifice on the right side; first five primaries strongly emarginated on the inner web, fourth or fifth, or fourth and fifth longest; tail slightly more than one-half of wing (about five-eighths); frontal bristles rather stiff, the terminal filaments not extending beyond the tip of the upper mandible; nostril placed at the anterior edge of the slightly swollen cere; ear tufts absent; tarsi densely feathered, toes bare.

There now remains another element to add to *Ciccaba* and this is *Noctua woodfordii* A. Smith (South African Quart. Journ., 1834, p. 312). This bird, divided into several races, inhabits the forested parts of Africa south of the Sahara and since 1850 has been carried in the genus now called *Strix*. Its systematic position has never been questioned and I was therefore quite unprepared to discover that the bird was not a strigine owl at all but a bubonine one, agreeing so closely with the genus *Ciccaba* that generic distinction does not seem to be feasible. Compared with *Ciccaba virgata*, which *woodfordii* most nearly approaches in size, we find the two have the same type of ear, virtually the same proportions of wing to tail, the same primary

formula, the same scoopings and sinuations on the five outer primaries, feathered tarsi and bare toes; with the exception of the very slightly weaker bill and feet of *woodfordii*, I am unable to detect any basis for a generic separation, and in my estimation this is far too slight a difference on which to base a genus. The removal of *woodfordii* from the genus *Strix* leaves the Ethiopian region without a single representative of the genus; its transfer to *Ciccaba* complicates the distribution of the latter and brings up the question whether there is an actual relationship between these American and African owls, or whether there exists merely a case of convergence.

It may be of interest in this connection to point out another case in the same category. *Bubo lettii* Büttikofer which inhabits the West African forest region has been placed sometimes in *Bubo*, sometimes in *Otus*, and finally came to rest in the monotypic genus *Jubula* proposed for it by Bates (Bull. British Ornith. Club, **49**: 90, 1929). While the bird is clearly neither a *Bubo* nor an *Otus* it might just as well have been transferred to the Neotropical genus *Lophostrix* Lesson instead of being placed in a monotypic genus. In fact, the only possible justification that I can find for maintaining *Jubula* is the fact that the ear openings are smaller than in *Lophostrix;* similarly, *woodfordii* has smaller orifices than *virgata*, nevertheless I should never deliberately propose a new generic name for the former on this character alone.

As I now understand *Ciccaba*, it would seem that the specific limits are too narrow, and that if they were broadened a better idea of the relationships within the group could be obtained. *C. virgata*, *C. superciliaris* and *C. suinda*[1] are without doubt representative forms and should be united as a single species ranging from northern Mexico to southern Brazil and Paraguay. In parts of South America this species has a red phase that appears to be entirely absent in Central America and northwestern South America. *C. huhula* and *C. nigrolineata* are closely allied representative species of the same size and proportions, but certain features of their markings are so dissimilar that I should hesitate to consider them conspecific. *C. albitarsus* bears a very strong superficial resemblance to *Strix hylophila*, but may be readily distinguished, even without examining the ear structure, by having the basal phalanges of the toes entirely bare (feathered in *hylophila*) and the distal portion of the outer primaries plain dusky or with only a few obsolete paler spots (instead of regularly barred with buffy).

If these proposed changes are accepted, the genus *Ciccaba* Wagler will stand as follows:

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[1] Kelso and Kelso (Biol. Leafl., no. 4, p. 39, 1934) have shown very satisfactorily, that *Strix suinda* Vieillot is really not applicable to a Wood Owl, but is certainly the earliest name for the southern South American race of *Asio flammeus*, and has many years priority over *breviauris* Schlegel. *Syrnium borellianum* Bertoni will replace *Ciccaba suinda* of authors, not of Vieillot.

Ciccaba virgata tamaulipensis Phillips
Ciccaba virgata squamulata (Bonaparte)[1]
Ciccaba virgata centralis Griscom
Ciccaba virgata virgata (Cassin)
Ciccaba virgata macconnelli Chubb
Ciccaba virgata superciliaris (Pelzeln)
Ciccaba virgata borelliana (Bertoni)
Ciccaba nigrolineata Sclater
Ciccaba huhula (Daudin)
Ciccaba albitarsus albitarsus (Sclater)
Ciccaba albitarsus goodfellowi Chubb
Ciccaba woodfordii umbrina (Heuglin)
Ciccaba woodfordii nigricantius (Sharpe)
Ciccaba woodfordii bohndorffi (Sharpe)
Ciccaba woodfordii nuchalis (Sharpe)
Ciccaba woodfordii woodfordii (A. Smith)

Syrnium suahelicum and *Syrnium sansibaricum*, both described by Reichenow (in Werther's 'Die mittl. Hochlände nördl. Deutsch-Ost-Afr.,' p. 272, 1898) are synonymous with *Ciccaba woodfordii nigricantius* (Sharpe); *C. w. bohndorffi* (Sharpe) is doubtfully distinct from *nuchalis* (fide Prof. O. Neumann, *in litt.*).

To show the difference in the size and asymmetry of the external ear opening in certain species of owls, the following table is appended. It must be borne in mind that it is not always possible exactly to determine the size due to various factors involved, such as the make of skin, damage in skinning or distortion in drying.

Form	*Left ear*	*Right ear*
Ciccaba virgata virgata	11 mm.	18 mm.
Ciccaba virgata virgata	13.5	17
Ciccaba virgata virgata	10.5	17
Ciccaba virgata virgata (alcoholic)	12.5	17.3
Ciccaba virgata centralis	12.5	17
Ciccaba virgata squamulata	11.5	17
Ciccaba virgata superciliaris	11.5	19.5
Ciccaba virgata macconnelli	14.5	17
Ciccaba borelliana	16	21
Ciccaba huhula	12.5	20
Ciccaba nigrolineata	12	16.5
Ciccaba nigrolineata	13.5	20
Ciccaba albitarsus	20	23
Ciccaba albitarsus	17.5	23
Ciccaba albitarsus	20	21
Ciccaba woodfordii nuchalis	8.8	13.7

average 4 specimens.

[1] *Ciccaba virgata amplonotata* Kelso, Proc. Biol. Soc. Washington, **46**: 151, 1933 (Mazatlan, Sinaloa) is a synonym.

Form	*Left ear*	*Right ear*
Ciccaba woodfordii suahelica	9.6	12.9
average 4 specimens.		
Ciccaba woodfordii woodfordii	6.4	7.7
Ciccaba woodfordii woodfordii	9.7	13.8
Ciccaba woodfordii subsp? (alcoholic)	8.5	12.5
Otus asio naevius	10	10.5
Otus asio maxwellae	10.5	9.5
Otus asio kennicotti	11	11
Otus choliba choliba	7	6
Otus albogularis albogularis	6	8
Otus albogularis aequatorialis	7.5	7
Otus vermiculatus	7.5	8.7
Otus vermiculatus	7.7	8.5
Pulsatrix perspicillata chapmani	11.5	9.5
Pulsatrix melanota	12.5	11.5
Pulsatrix melanota	11	11
Pulsatrix melanota	10.5	12.5
Pulsatrix koeniswaldiana	11	12
Lophostrix cristata wedeli	10	11.5
Jubula lettii	7.7	7.6

The size of the external ear orifice of *Strix hylophila* Temminck, compared with two other species of strigine owls is also given herewith:

Form	*Left ear*	*Right ear*
Strix hylophila	19 mm.	24.5 mm.
Strix aluco aluco	20	23.5
Strix fulvescens	25	27.5

It will thus be seen that the asymmetrical ear openings of *Ciccaba* approach the condition found in *Strix* and other strigine owls, but lack the dermal flap characteristic of that subfamily.

I am indebted to the authorities of the Field Museum, American Museum of Natural History, U. S. National Museum, and the Bureau of Biological Survey for the loan of material; to Mr. N. B. Kinnear of the British Museum for the loan of an alcoholic specimen of *Ciccaba woodfordii;* and to Mr. C. E. Underwood for promptly supplying an alcoholic specimen of *Ciccaba virgata.*

Museum of Comparative Zoölogy
Cambridge, Massachusetts

OWL STUDIES AT ANN ARBOR, MICHIGAN

BY KENNETH A. WILSON

THE main purpose of this study was to determine the economic status of five species of owls found in the vicinity of Ann Arbor, Michigan. It considers their behavior when flushed, their food and feeding habits, their distribution by cover types and the distinguishing characteristics of their respective pellets and the effects of weathering upon these. The methods employed in this investigation have varied but little for the different species. The period of study extended from September, 1932, to May, 1933. An attempt was made to locate all of the individual owls in the region studied.

DESCRIPTION OF THE AREA

The country along the Huron River valley is flat to rolling. It was originally covered with hardwoods, and deciduous woodland tracts still extend intermittently for miles, bordered here and there by farm land. These wooded areas consist of second-growth hardwoods most of them from forty to sixty years old and others up to one hundred years old or older. Some of the common species are: pignut and shagbark hickory, swamp white oak, red oak, white oak, bur oak and American elm. The majority of such trees yield seed and nut crops which help support a considerable rodent population, most numerous of which are the meadow mice and deer mice.

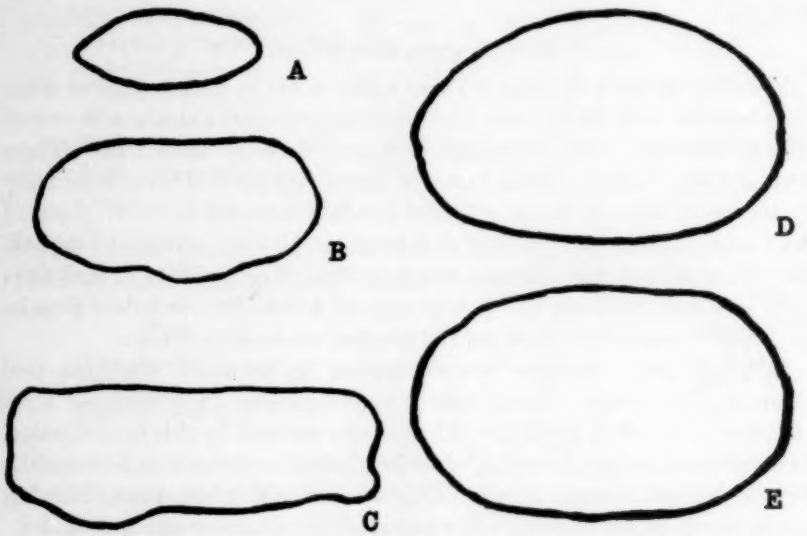
Although few evergreens are indigenous to southern Michigan (red cedar, ground juniper, black spruce) approximately three hundred acres have been planted to conifers within the area covered by this investigation. These plantations consist mainly of white pine and red pine with occasionally Scotch pine and Norway spruce. They vary in height from ten to fifty feet and in age from ten to twenty-five years.

Wooded areas farther from the river are in scattered blocks of from five to ten acres. The ages here are about the same as those in the river-bottom hardwoods; the older stands occupy about one-fifth of the total area and are generally located within moist or semi-swamp sites where the American elm and black ash predominate. The forty to sixty age-class stands are on well-drained soils and consist for the most part of oak and hickory. Marsh and agricultural lands border the wooded areas.

LONG-EARED OWL (*Asio wilsonianus*)

Long-eared Owls were found in two distinct habitats. During the late summer, fall and winter months they inhabited the coniferous woods and during their nesting and brooding seasons from March until June, they were found in the hardwoods.

Two families of this species were observed consistently. One was located along the Huron River close to Ann Arbor in a five-acre Scotch- and red-pine plantation. This stand, which was bordered on two sides by marsh land, was from ten to fifteen feet high and had frequent open areas within it. The other area was a large spruce and tamarack swamp about one hundred acres in extent and also adjacent to marsh and agricultural land. The owls were located in the evergreen growth through the presence of pellets, feathers and the ureal deposits on the trees. Accurate location of areas used by owls was possible only by a complete survey of the area. Where the stands were too large to cover completely, random sample plots were established.



TEXT-FIG. 1.—Average outlines of owl pellets. A, Saw-whet Owl; B, Screech Owl; C, Long-eared Owl; D, Barred Owl; E, Barn Owl. × 1. For limits of dimensions see text.

The typical pellet of this owl is oblong and narrowly cylindrical, 5 to 6 cm. long by 1.5 cm. in diameter. This pellet may be confused with that of the Screech Owl, as there is a close similarity in the form of the bolted matter of the two birds (Text-fig. 1). There are marked variations in the length of the Long-eared Owl's regurgitations but the diameter of the pellet seldom varies more than a few millimeters. In the case of the Screech Owl there was no typical shape and in some cases pellets resembled the smaller regurgitations of a larger owl.

When roost trees were found, they were marked with a white cloth and

recorded on the field map. They were then visited weekly and all pellets found under them were collected. Pellets of questionable origin were discarded unless the owl was actually observed or its identity made certain by the presence of feathers. Because pellets of the Long-eared Owls were frequently broken in their fall to the ground, an accurate pellet count was found to be impossible. An attempt was made to establish some criterion for a quantitative measure of the pellets by averaging 82 randomly picked regurgitations of this owl. The same procedure but with varying numbers of samples was finally adopted for the other owls. The extreme range in sizes of pellets from the Long-eared Owl, for example, was: maximum length, 8.4 cm.; minimum length, 2.7 cm.; maximum diameter, 2.2 cm.; minimum diameter, 1.3 cm. Owls never used any one roost more than two or three weeks, yet as many as 125 pellets were found at the same tree. The explanation for this is that the birds are gregarious. It is known, for instance, that the offspring remain with their parents for eight or ten months or until the next mating season.

Since the owls left the coniferous cover about the middle of March, no pellets were found there after this time. Also persistent search for the next two months in the adjacent hardwoods disclosed only a few pellets. Only one nest of this species of owl was discovered. This was late in May when the writer's attention was first attracted to it by the excited calls of a group of Crows. This nest contained five young owls. Subsequent observations disclosed that no harm was done to the young owls by Crows.

From the 1,138 pellets collected from this species of owl, 1,935 skulls were taken or an average of 1.7 per pellet. These skulls were identified as follows: meadow mice (*Microtus pennsylvanicus*), 1,458 skulls; deer mice (*Peromyscus* sp.), 209; Cooper lemming mice (*Synaptomys cooperii*), 184; short-tailed shrew (*Blarina brevicauda*), 41; least shrews, 2; jumping mice (*Zapus hudsonius*), 25; little brown bat (*Myotis lucifugus*), 1; Norway rat (*Rattus norvegicus*), 2; and 13 birds, mostly Fringillidae.

SCREECH OWL (*Otus asio*)

The Screech Owls were found to inhabit both hardwood and coniferous cover. Of the seven known occurrences in hardwoods, five were within the larger mature timber. Signs of this bird's presence were seldom noted in the smaller hardwood growth and the two occurrences were apparently attributable to transient birds. Every coniferous stand investigated harbored this owl and within mixed stands of white and red pine the former was usually chosen by the Screech Owl as roost trees. Of fifty-six roost trees found in such a stand, forty were white pine. Another choice roosting site was a pure Scotch-pine stand where 112 pellets were found under fifty-two trees concentrated on half an acre. This area, however, was abandoned in

January when the owls moved to a thick spruce stand a quarter of a mile away. Later 257 pellets were found under eight trees. Ureal deposits were found on all roost trees and were especially noticeable in areas of dense stocking, a characteristic which is found most helpful in locating roosts. A five-acre stand of red cedar and ground juniper also seemed to be a favorite site for this species, where they apparently used the red cedar for roosting purposes as was evidenced by the general presence of pellets. It was difficult to determine the presence of this species in hardwoods, and the detailed reconnaissance used in coniferous growth was found to be impracticable in hardwoods because of the extensive areas of the type. The most likely areas including the ground beneath decapitated, hollow and non-defoliated beech trees were searched for pellets. Few were found, however, and apparently most regurgitations were deposited within hollow trees which were numerous in the larger hardwood stands. No marked sign of gregariousness was ever noted in this bird. During the fall months single birds only were flushed and it was not until January and the commencement of the mating season that they were seen in pairs.

The food taken by this bird is indicated by an examination of 1,408 pellets containing 1,549 skulls. The following animal remains were identified: meadow mice (*Microtus pennsylvanicus*), 1,344; deer mice (*Peromyscus* sp.), 73; Cooper lemming mice (*Synaptomys cooperii*), 48; short-tailed shrew (*Blarina brevicauda*), 49; jumping mice (*Zapus hudsonius*), 10; least shrews, 5; red squirrel (*Sciurus hudsonicus loquax*), 4; eastern mole (*Scalopus aquaticus machrinus*), 3; Norway rat (*Rattus norvegicus*), 2; birds, 4; parts of crawfish, 4; and insects, 3.

SAW-WHET OWL (*Cryptoglaux acadica acadica*)

The Saw-whet Owl was not abundant. The few birds located were found in small coniferous cover and usually in the more dense stands. The observer, by approaching quietly, could very often get as near as two feet from the bird before it flew and, on one occasion, one of these birds was captured by the writer. There was no set method used in finding this bird; the discoveries were made always while the writer was searching for some other owl.

Its regurgitations were small, 2 to 2.5 cm. long by 1 cm. in diameter and quite typical. The pellets of the Screech Owl, which were of this size, lacked the characteristic compactness of the Saw-whet Owl's pellet. However, some confusion exists in distinguishing between this owl's pellet and that of the Sparrow Hawk (*Falco sparverius*).

BARRED OWL (*Strix varia*)

Barred Owl pellets were most frequently found in coniferous stands, though on rare occasions they were located in hardwoods contiguous to

these. During the nesting season, however, coniferous cover was abandoned and in one case a nest was located in a hollow elm close to the Huron River. There was a marked tendency toward the utilization of coniferous cover in instances of mixed stands and in a thick growth of white pine and spruce of the ten- to fifteen-year age class, ten to twenty feet high, pellets were deposited in the more dense areas, and fifty of the sixty pellets gathered were found beneath white pines. There were exceptions, however; for instance, during stormy and foggy days the Barred Owl seemed to choose the more open habitat. At such periods pellets were commonly found under a few volunteer locusts, mixed within the thicker cover of the pines. A variable number of roosts was used and seldom for more than a week at a time. In one instance, however, records show the distribution of 124 pellets beneath eight trees, with a maximum count of thirty-five regurgitations at one roost.

A total of 249 Barred Owl pellets was collected, in which were identified 777 skulls, as follows: meadow mice (*Microtus pennsylvanicus*), 648; deer mice (*Peromyscus* sp.), 29; Cooper lemming mice (*Synaptomys cooperii*), 7; jumping mice (*Zapus hudsonius*), 8; red squirrel (*Sciurus hudsonicus loquax*), 1; house mouse (*Mus musculus*), 1; short-tailed shrew (*Blarina brevicauda*), 53; least shrews, 8; amphibians, 5; insects, 9; and birds, 8.

BARN OWL (*Tyto alba pratincola*)

The majority of Barn Owl pellets were found in a red- and white-pine stand, twenty to thirty years of age. During the late summer and fall, pellets were located under the red-pine, while during the winter and early spring months, they were more frequently located within the more dense white-pine cover. Although most of the pellets were located on less than one acre of land, over fifty trees in an adjoining fifteen-acre stand of pine yielded pellets. During the winter months the Barn Owl seemed very consistent in its use of the same roost; one owl used the same tree on eighteen successive days. Hardwoods and spruce in a cemetery bordering the residential section of Ann Arbor, were inhabited by Barn Owls. Spruce trees in the area were used almost exclusively, where ninety-one pellets were collected beneath fifteen trees and thirty were taken from under one. Barn Owls also roosted in a nearby church steeple.

It was difficult to distinguish between the pellets of this owl and the pellets of several of the larger owls (Text-fig. 1). Regurgitations of the Snowy Owl (*Nyctea nyctea*), although larger than the average Barn Owl pellet were, however, identical in shape and pattern. Measurements were made of one hundred each of Barred and Barn Owl pellets, gathered from roosting sites positively known to be occupied by these birds. A final average of each lot revealed a difference in average length of less than one millimeter. Such close similarity calls for other means of identification.

As in the case of the Barred Owl, the Barn Owl also exhibited a marked solitary tendency and like the Screech Owl it did not tolerate another of the same species until the mating season. It was approached with more success than any other owl studied and one bird became so accustomed to my presence that it would stare for seconds before flying.

The food of this bird did not vary and during the nine months that its pellets were analyzed no marked change in diet was noted. The diet of other species, especially the Screech Owl, showed a definite cycle; during the spring many of these birds fed upon insects and amphibians. Quantitatively the average Barn Owl pellet contained 3.05 skulls. A collection of 619 pellets containing 1,888 skulls was gathered. The analysis of these pellets showed the following: meadow mice (*Microtus pennsylvanicus*), 1,710; deer mice (*Peromyscus* sp.), 43; Cooper lemming mice (*Synaptomys cooperii*), 37; jumping mice (*Zapus hudsonius*), 5; red squirrel (*Sciurus hudsonicus loquax*), 1; short-tailed shrew (*Blarina brevicauda*), 73; least shrews, 7; snail, 1; weasel, 1; and birds, 10.

EFFECT OF WEATHERING ON PELLETS

From the beginning of this investigation it was apparent that a knowledge of the resistance of pellets to weathering would be valuable. This would indicate how long a pellet remains intact after regurgitation. In this study, only the well-formed pellets made up of mammal remains are considered. Those made up of crawfish, insects, fish and frogs do not hold together readily even when fresh. Apparently the degree of protection provided by cover is the most important factor in determining the relative rate of deterioration. Pellets under museum conditions, unless infested by insect larvae, seem to remain unbroken almost indefinitely. Freezing and thawing and rainfall readily decompose the pellets. The smaller pellets remained intact in the open only four to six weeks during the spring. Larger ones, such as those of the Barred and Barn Owls, remained whole from eight to ten weeks. Pellets of all owls remained whole during the winter for from three to five months. After the pellets have weathered away it is natural to expect greater numbers of skulls and animal parts on the surface of the ground than are usually found. This should be especially true in coniferous forests where nothing but the needles forms the ground cover. However, the reverse of this seems to be true as shown by observations made during the spring of 1932. Several dozen Long-eared Owl pellets where cached beneath a Scotch pine for about a year, at the end of which only a few of the larger skulls were found. The pellets had been broken down by weather, insects, mice and other agencies, and the smaller skulls were buried beneath the needles.

RELATIONSHIP OF OWLS TO SONGBIRDS

One of the interesting findings in this study is the fact that birds were so unimportant in the diet of the owls. Songbirds were numerous in each owl habitat studied. Many birds used the same cover for roosting and nesting but in spite of this, songbirds actually averaged less than one per cent of the total food found in all the pellets studied. However, the examination of pellets from a pair of nesting Barred Owls with a family shows that twenty per cent of their food at this time consisted of birds, mostly woodpeckers. A Barn Owl roosted in a tree for nearly a week overlooking an adjacent white pine that held a Mourning Dove's nest containing two downy young. No harm to the doves resulted and six pellets gathered beneath the roost contained only mice. Quail were common in or adjacent to each of the owl-inhabited areas, but pellets analyzed indicated that the quail were not eaten. The tendency of the owls in this vicinity to ignore birds can possibly be explained by the abundance of mice, and should the supply of mice and shrews become reduced, it is possible that any of the species of owls studied might take a larger number of songbirds than was indicated in this study. With the exception of the nesting Barred Owls previously mentioned, at no period during the study did the few birds consumed appear in the pellets at any particular time but they were distributed in about equal proportions from September to May. A large number of songbirds' roosts were discovered and many of these were in the very roost trees used by the owls.

RELATIONSHIP OF OWLS TO MAMMALS

The 3,418 pellets analyzed contained 6,153 skulls and animal parts from which the individual animals were identified. Of this aggregate, rodents made up 95 per cent; shrews and moles, 4 per cent; birds, 0.62 per cent; crawfish, 0.15 per cent; weasel, bats, frogs, salamanders, snails, and insects, 0.23 per cent.

Considering the rodents separately, only 84 pellets of the total analyzed contained none. Of the seven species represented, 88.25 per cent were meadow mice (*Microtus pennsylvanicus*); 6.00 per cent deer mice (*Peromyscus* sp.); 4.70 per cent Cooper lemming mice (*Synaptomys cooperii*); 0.82 per cent jumping mice (*Zapus hudsonius*); 0.15 per cent red squirrel (*Sciurus hudsonicus loquax*); and 0.08 per cent Norway rat (*Rattus norvegicus*) and house mouse (*Mus musculus*). The largest number of individual animals found in a single pellet (Barn Owl's) was seven, all of them meadow mice. Frequently, pellets of the Barn and the Barred Owls contained four and five individuals, though many of these were often composed of small shrews, mostly *Sorex* sp. The larger animals, such as rabbit, muskrat, mink and skunk, although numerous were found not to be among the owl foods. The

only larger mammal represented was a weasel, the bones of which were found in two large Barn Owl pellets.

Greffinius (1932, unpublished manuscript, 'A preliminary report on a method of censusing mice'), making a study of small-mammal populations in the vicinity of Ann Arbor, and along a marsh hunted by a family of Long-eared Owls reported upon in this study, demonstrated that a close frequency ratio existed between the species of mammal foods consumed by this owl and the smaller mammal species trapped from an area.

The following proportions of animal life (individual animal densities) were found by Greffinius: meadow mice (*Microtus pennsylvanicus*) ninety-two per cent and short-tailed shrew (*Blarina brevicauda*) eight per cent. Comparing these figures with data obtained from the analyses of 671 Long-eared Owl pellets taken in the same vicinity, eighty per cent contained meadow mice and three per cent short-tailed shrew, which indicates that in the case of mammals, owls apparently feed upon the food that is most readily available.

Economic Importance

The importance of owls to the farmer is relative and is determined by the quantitative values of the average pellet. The Barn and Barred Owls, for instance, which average three small mammals to a pellet, would be of as much value to the farmer as four Saw-whet Owls, three Screech Owls and two Long-eared Owls, providing that they regurgitated the same number of pellets.

Summary

Traits and Relationships

Barn Owl

Relationship to hawks.—None observed.

Relationship to other owls.—Occupied a one-acre area used by a pair of Screech Owls,—no animosity discovered. Pellets of both birds found beneath the same trees. Barred Owls likewise frequented adjacent conifers without apparent animosity.

Relationship to small mammals and other animal life.—Game birds, none; small game, none; fur bearers, a weasel; songbirds, ten. The three Barn Owls studied ate of a small-rodent and shrew diet during every season.

Roosting cover preferences as determined by the pellet.—Conifers, 597 pellets; barn, 14 pellets; church, 8 pellets.

Migration tendencies.—No real migration observed; one owl did considerable wandering, however, as was noted in the periodic absence of pellets.

Gregariousness.—None observed; a solitary bird except during the nesting season. Birds were seen together as early as January and in pairs.

Barred Owl

Relationship to hawks.—Two Sharp-shinned Hawks (*Accipiter velox*) found in pellets during the early winter.

Relationship to other owls.—All three habitats occupied by this bird also inhabited by the Screech Owl; both birds seemed tolerant of each other.

Relationship to small mammals and other animal life.—A mouser the year round except during and after the nesting season; at this time one-fifth of its diet was songbirds, also amphibians. Songbirds, 8.

Roosting cover preferences as determined by the pellet.—Conifers, 190 pellets; hardwoods, 59 pellets, most of these found after the mating season.

Migration tendencies.—None observed except during the nesting season, and this was local.

Gregariousness.—None observed; a solitary bird except during and after the mating season.

Long-eared Owl

Relationship to hawks.—Occupied and hunted the same areas used by Marsh Hawks (*Circus hudsonius*), and the Red-shouldered Hawk (*Buteo lineatus*).

Relationship to other owls.—Occupied the same locality used by a Great Horned Owl (*Bubo virginianus*); nothing found in the pellets of either birds that would signify animosity.

Relationship to small mammals and other animal life.—Area of habitation and hunting grounds occupied by a covey of quail, pheasants, many rabbits, several opossums, a family of skunks. None of these was found in the analysis of pellets. Birds, 13.

Roosting cover preferences as determined by the pellet.—Conifers, 1,136 pellets; hardwoods, two pellets, both of which were found in an adjacent hardwood forest during March after commencement of the mating season at a time when no pellets were being found in the conifers.

Migration tendencies.—Marked; extent unknown; returned in November to old roosting area of the spring before.

Gregariousness.—Marked, offspring remained with the parents until January of the next mating season when all but the mated adults disappeared.

Screech Owl

Relationship to hawks.—None observed.

Relationship to other owls.—Was found in every owl habitat studied excepting those of the Long-eared and Saw-whet Owls.

Relationship to small mammals and other animal life.—Winter months, rodent life and an occasional bird. Spring months, rodent life, crawfish, insects and an occasional bird. Summer months, ? Fall months, rodent life, crawfish and insects. Birds, four.

Roosting cover preferences as determined by the pellet.—Conifers, 1,361 pellets; hardwoods, 47 pellets, most of these beneath beech trees that had retained their autumn foliage, the tawny-colored leaves blending perfectly with the owl. During cold and inclement weather, however, such owls doubtless roosted in several of many hollow trees in the area for few pellets were found beneath these trees at any time.

Migration tendencies.—None observed.

Gregariousness.—None observed; pair together during the late winter.

Saw-whet Owl

No adequate records.

Flight Characteristics

Barn Owl

Flushing distance.—Upon intrusion the bird flushes at from five to one hundred feet. It alights again at from three hundred to five hundred feet.

Appearance on the roost.—There was no attempt to simulate a branch, but the bird would stare, until some movement caused it to fly.

Character of flight.—When flushed the flight is slow and clumsy into the open and above the trees; when pursued by Crows it is slow, flapping and irregular. Ordinary flight is noiseless, moth-like and effortless, about ten to fifteen miles per hour.

Barred Owl

Flushing distance.—Disturbed to flight during the nesting season, parent birds flushed at from five to one hundred fifty feet, at other times at from twenty-five to one hundred feet, alighting at from two hundred to one thousand feet.

Appearance on the roost.—Stares wild-eyed, body barrel-shaped.

Character of flight.—When flushed, the flight is slow but faster than that of a Barn Owl and in conifers, usually just above the tops of the trees. Pursued by Crows in conifers, it flies above the trees with no decided effort to be rid of the pursuers.

Long-eared Owl

Flushing distance.—Took to flight upon intrusion at from ten to twenty-five feet and alighted at from seventy-five to three hundred feet.

Appearance on the roost.—Stiff and straight, simulating the branch of a tree; difficult to distinguish from a background.

Character of flight.—When flushed, the bird takes off in a downward swoop to earth, thus getting away very rapidly; pursued by Crows in conifers, its flight is noiseless, effortless, zigzag in and out among the trees and too fast for the Crow. In the open, the flight is less zigzag and the Crows keep up. Ordinary flight is slow, about ten to fifteen miles per hour.

Screech Owl

Flushing distance.—Disturbed to flight in conifers, it flushed at from ten to one hundred feet, alighting at from two hundred to five hundred feet.

Appearance on the roost.—Similar in appearance to the Long-eared Owl but smaller.

Character of flight.—When flushed, a downward flight gets it away rapidly. Ordinary flight is slow and graceful, ten to fifteen miles per hour.

Saw-whet Owl

Flushing distance.—Upon intrusion the bird flushed at from two to fifty feet, alighting at from seventy-five to one hundred feet.

Appearance on the roost.—Very tiny, about as large as a Robin! Like other small owls, it also tries to minimize its size and often looks at the intruder in a squint-eyed, sleepy manner; a sudden movement, however, opens the eyes widely.

Character of flight.—When flushed it gets away fast, the momentum in flight gained by a downward swoop similar to that of a flying squirrel.

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Salisbury, Maryland

BIRDS OF CENTRAL LUZON

BY CAPTAIN L. R. WOLFE, U. S. ARMY

THE ensuing notes are from personal observations made during the writer's tour of duty at Fort McKinley, Rizal Province, Philippine Islands, from December, 1927, to March, 1930, and are presented with the intent to record some little-known or heretofore unpublished data concerning the life habits of the birds of this region. In addition there has been included some information concerning the habitats and distinguishing field-marks which would be of use to one interested in field study. The native dialect (Tagalog) name, where known, is given in parenthesis under each species. These notes relate only to such species as were actually found nesting, and are meant in no way to indicate a complete list of the resident birds of the region. Especial care was observed in all identifications and in every case where the slightest doubt existed, specimens were secured.

Practically nothing has been published concerning the life histories of Philippine birds, excepting an article by Grant and Whitehead, which appeared in 'The Ibis,' volume 4, 1898, and a few miscellaneous notes in various issues of the 'Philippine Journal of Science.' The nests and eggs of some of the species here described have heretofore been unknown; others have been known only from closely related species breeding in continental Asia, while the subspecies resident in the Philippines have remained unknown. Still others have been described from specimens taken in India, China or Australia, but never recorded as occurring in the Philippines. The reason for this is very apparent to one who has spent any time in the Islands. The breeding period of any individual species is never confined to a few weeks as is the case with birds inhabiting a temperate climate, but may cover any time within several months. Dense vegetation, a tropical sun and the complete lack of any preliminary data concerning habits, all add to the hardships of an observer and the return for expended effort is so small that it might well discourage the most enthusiastic worker.

In central Luzon there are two distinct seasons of the year—the rainy and the dry seasons. The former begins about the first of June, with July and August the months of heaviest precipitation; then the rains gradually subside until October. During November there is usually little rainfall. The ground becomes dry and the temperature increases month by month until the rains come again in June. March, April and May constitute the season of highest temperature; during these months the ground becomes extremely dry and hard, many of the trees become bare and grass takes on a withered, brown aspect.

The breeding cycle of any species is of course directly related to food

supply and the seasonal changes of climate. In view of this the nesting periods are here very much prolonged; birds of the various orders breed in different seasons, and the nesting period of an individual species normally covers two or three months. In fact, occupied nests were found in every month of the year, although the only species found breeding throughout the entire year was Cabanis's Weaver. In general the breeding periods of birds in central Luzon may be divided somewhat as follows: Falconiformes, from December to April; Rallidae, Ardeidae and other marsh-inhabiting species, from June to November. Among the Charadriidae, *Charadrius dubius dubius* breeds in April or May before the rains, and *Rostratula benghalensis* breeds after the rainy season. The majority of the Passeriformes nest from February to June, and more species breed in April and May than in any other months.

To one familiar only with the nesting habits of birds of the temperate zone, the study of Philippine birds is an interesting contrast. Strangely enough, all nests are placed in relatively more open situations, since the dense foliage, which we of the temperate zone are accustomed to think of as protective cover, is here infested with numerous arboreal lizards and snakes and therefore open situations are really protective; all nests are much more frailly and loosely built, which apparently is to avoid excessive temperatures within and afford ventilation. An additional point of interest is supplied by the fact that most tropical species deposit a smaller number of eggs to a set than do birds of the same family breeding farther north—two or three eggs constitute a full set for most of the small Passeriformes. This characteristic is even more strikingly seen in the rails and gallinules, which lay ten or more eggs in temperate climates, but only three or four in the Philippines.

It is the writer's desire to express his thanks and appreciation to the late R. C. McGregor of the Philippine Bureau of Science, Manila, Philippine Islands, for valuable assistance in the identification of specimens, and for granting free access to the wonderful collection of skins in the Museum of the Bureau of Sciences. He is equally indebted to Mr. James Lee Peters of the Museum of Comparative Zoology, Cambridge, Massachusetts, for the systematic arrangement of species in this list, and for editing and checking of scientific names.

PHILIPPINE GREBE, *Poliocephalus ruficollis philippensis* (*Su-li-a'-sit*).—These little grebes are rather common in favorable situations. They were found breeding in the immense marshes along the northern edge of Laguna de Bay and in the marshes around the fish ponds in the western part of Bulacan Province. The birds were very wild, and when disturbed kept well out in the open water, which, due to their agility in diving, rendered specimens very hard to secure. The writer found a fairly large colony breeding in the marshes near Obondo on September 16, 1928. The water

there was then about three and one-half feet deep, and the nests were floating among the scattered growth of reeds.

Whenever a bird leaves its nest, it covers the eggs with part of the nesting material, so that each nest appears as only a mass of floating vegetation. The nest is always wet, and the decaying vegetable matter doubtless furnishes much of the heat required for incubation, while the mud and water in the nest further abet the decomposition of this material. The covering of the eggs, then, seems to have two objects: protection from enemies and continuance of incubation during the bird's absence. Some nests which were examined, had apparently been covered for several hours, as the outer surface was nearly dry; nevertheless, beneath the outer surface they were still wet and very warm.

A typical nest is a floating mass of moss, dead reed stems, grass and other bits of vegetation, about six inches in diameter; a small amount of mud is mixed around in the center and the whole nest is thoroughly soaked and more or less decomposed. The number of eggs varies from three to six with four the usual complement. When fresh these are a light sky blue in color, and are coated with a thin, chalky deposit, which soon becomes nest-stained; after a few days in the nest, this color changes to a light yellow or olive brown. The average size of the eggs is 35.9 x 27.1 mm.

LITTLE YELLOW BITTERN, *Ixobrychus sinensis astrologus* (*Ba-cau' bing-ey*).—The Little Yellow Bittern is usually common about the shallow marshes where water hyacinths and other aquatic plants abound, but is seldom observed, even where common, unless one penetrates its chosen habitat by canoe. The writer has never observed them other than in areas covered with water, emphatically never in marshy meadows. In general appearance and habits the birds very closely resemble the American Least Bittern; they are difficult to observe when they are perched in a clump of reeds, and seldom flush until very closely approached.

Several nests with eggs were found on May 26, 1929, just northwest of Los Baños in an extensive marsh along the western shore of Laguna de Bay. All these were placed in marsh grass, just a few inches above the water and were very frailly built—merely a few stems on a loose platform of broken-over grass. The eggs are plain white with a slight bluish cast and number two or three; eight eggs have an average size of 32.6 x 23.6 mm.

CINNAMON BITTERN, *Ixobrychus cinnamomeus* (*Ba-cau' ca-ne'-lo*).—The Cinnamon Bittern is seldom found in the swamps or flooded areas which are inhabited by the Little Yellow Bittern. It is rather a bird of the low, marshy meadows where there is only sufficient water to keep the ground wet and spongy throughout the breeding season. The writer has never observed it in areas which were actually flooded, though an occasional bird was flushed along the edge of a stream.

This species breeds much later in the season than the Little Yellow Bittern, probably due to the fact that much of the potential breeding area is very dry until after the beginning of the rainy season. Eggs have been found from July until August 21 in nests that were usually placed on top of bent-over stems in grass two or three feet high—only occasionally in a low bush. A nest found July 17, 1929, was located in such a grassy situation in a wet meadow. It was about seven inches in diameter and was built on top of a tussock with broken-over stems; it contained three well-incubated eggs. These eggs are white in color with a very faint blue-gray tinge, and the usual number is three or four. Eleven specimens have an average measurement of 36.2 x 27.4 mm.

MALAY BRAHMINY KITE, *Haliastur indus intermedius* (*La-uin'*).—The Malay Brahminy Kite is the most common raptor in central Luzon, and shows a marked

preference for the vicinity of water at all times except during the short breeding season. It is commonly seen around Manila Bay and Laguna de Bay, and is abundant along the northern shore of Lake Taal. Its habits are those of a scavenger, and its food consists mainly of dead fish and offal found floating on the surface of the water. Other items are doubtless included in the diet, but it has never been observed hunting away from the near proximity of water.

The nesting season begins about the first of February, when the birds leave the waterfront and scatter to their nesting haunts in the mountains. This movement is rather concerted and very noticeable: kites were very abundant about Lake Taal on January 20, 1929, when fifteen or twenty could be seen at one time, yet three weeks later there was hardly a kite to be found there. The nest is never found near human habitation. The site selected is always two or three miles back in the mountains, usually in the top of a partially dead tree growing on a steep slope, a situation affording an immense view of the surrounding country. There appears to be a distinct preference for a particular type of tree ideally located, as several sites examined showed the same characteristics.

The breeding season of this kite is less prolonged than that of most other tropical species, extending from the first to the third week of February; slightly incubated eggs have been found on February 9, and young a few days old were observed on March 9. A pair occasionally uses the same nest in succeeding years, and it is believed that they habitually nest in the same locality year after year. However, they strongly resent the interference of man and will leave the vicinity upon the least provocation. A newly completed nest was located on January 30, 1929; a bird was flushed from it on February 9, which was soon joined by its mate, both birds circling closely overhead. But when the writer climbed to the nest, they left the vicinity and were not seen again. This nest was about sixty feet from the ground in the uppermost branches of a tree, growing on a steep, densely wooded hillside. It measured twenty-five inches in diameter and twenty inches in height on the outside, with an inner depression five inches in diameter and three inches deep. It was composed of dry sticks and twigs, with a lining of shorter twigs, bits of rough bark, pieces of dirt and carabao dung.

The Malay Brahminy Kite usually lays two eggs, but there may be three. These are dull grayish white in color, occasionally plain, but usually faintly stippled around the larger end with small spots of light brown; rarely they are well marked with reddish brown and lavender. Six eggs have an average measurement of 53.6 x 41.6 mm.

WHITE-BREASTED SEA-EAGLE, *Haliaeetus leucogaster* (*Ma-na-ol'*).—The White-breasted Sea-eagle is not uncommon about the larger lakes, but remains well away from all human habitation and is always wild and shy. It is seen often at Lake Taal, and several pairs breed in the mountains north and east of Laguna de Bay. Its food here consists mainly of water snakes, which it has been observed carrying to its feeding perch on several occasions.

The normal breeding period is during December and January. The nest is placed in a large tree remote from human meddling, and is occupied year after year, presumably by the same pair of birds. Each year more sticks and other materials are added, and in the course of time it becomes a huge affair. One such nest was examined in a giant tree in the mountains east of Pililla. It was at least ten feet in height by six or seven feet in diameter, and judging from the accumulation of débris, it had been in use for years. Five occupied nests of this species were examined, three of which were on isolated islands and in large trees close to the edge of the water;

another was about a mile inland from the north shore of Lake Taal, and another east of Pililla, about three miles inland from the Laguna. Whenever a nest is disturbed, both birds circle overhead, but never drop very low. The only notes I have ever heard were while the birds were circling the nest and may be conveyed by the syllables, *cank-conk-cank*, with somewhat of a nasal twang.

A typical nest of this species, visited January 20, 1929, was on one of the small islands in Lake Taal. It was about forty feet from the ground in a tree just back from the water, and was the only nest found that was less than a hundred feet from the ground. It was an old structure about five feet in height and four feet in diameter; the nesting débris was wedged in between two large forks of the tree. The base was a rude platform of old and decayed sticks two or three inches in diameter, on top of which was piled a quantity of smaller sticks, pieces of vine and grass. The center of the nest was a depression, about four inches deep by ten inches in diameter, lined with strips of vine and grass with a mat of green leaves directly underlying the eggs. These fresh, newly plucked leaves were a part of every nest.

The White-breasted Sea-eagle usually lays two eggs, though one may occasionally constitute a complete clutch; these are pure white, rather rough-grained and more or less nest-stained. Three sets of eggs average 72.1 x 55.2 mm.

PHILIPPINE PYGMY FALCON, *Microhierax erythrogenys erythrogenys*.—The Pygmy Falcon is the smallest of the birds of prey and is apparently not very common in any locality. Its preferred habitat is an opening at the edge of the forest or an area that has been cleared but in which scattered dead stubs are still standing. In such a situation, one or two birds may frequently be found perched on the end of a dead limb. They seemed to be most common in the hills just north of Talisay. McGregor says of this species: "Extremely local in habits. Often found perching on a dead limb at the top of some tree, and may be met with in exactly the same place day after day. It feeds on insects and often leaves its perch on short flights in pursuit of its prey, returning promptly, however. When shot at but not killed, it usually takes but a short flight, and returns at once to its favorite perch. Small flocks frequently found together." It is the writer's belief that these small flocks are family groups which have not yet separated.

The nest of the Pygmy Falcon is placed in the deserted nesting hole of a barbet or a woodpecker, and the site chosen may be at any height from the ground; no nesting material is added. The normal breeding period is probably during March and April, though the eggs of this species have not been collected. Two nests containing young birds were found in the hills north of Talisay; one was located on April 16, 1929, the other on April 24, 1929. One or both of the parent birds were always in the vicinity of the nesting tree. They were noisy and pugnacious in the defense of their home and made repeated swoops on the writer while at each nest. The eggs of this falcon have never been described, but those of a closely related form which breeds in India are pure white.

ERNEST'S PEREGRINE FALCON, *Falco peregrinus ernesti*.—Ernest's Peregrine Falcon is the tropical representative of the European Peregrine Falcon and the American Duck Hawk. It is an extremely rare bird, usually found only in association with steep cliffs or rocky canyons. On several occasions a pair of these birds was observed about the high cliffs on Napayong Island in Lake Taal, where they doubtless breed, though evidence is lacking. Another pair was observed in the cliffs near Montalban with better success. The actions of this pair, when first noticed about the middle of April, 1929, indicated that they had young and that the general location of the nesting ledge was near the top of the north canyon. However, it was

several days before the exact location of the nest could be determined, and several days more before the necessary equipment for the climb could be secured. Finally, on May 5, 1929, the writer was able to get to the top of the cliff, and, after much difficulty, to descend to the nest, which was on a narrow ledge about 125 feet from the top. Two young were found, about two-thirds grown. No nesting material was in evidence, though the ledge was littered with bats' wings, feathers and other débris.

Normally, the breeding of these birds is at its height about March 1, and it is characteristic of this species that a pair will occupy the same nesting ledge for many successive years. From the inaccessibility of the eyrie described, it appears that they will remain undisturbed here for at least a few more generations.

FRANCOLIN, *Francolinus pintadeanus pintadeanus*.—The Francolin is an introduced species in the Philippine Islands. Very little information is available as to just when and by whom it was first introduced, although some of the older residents at Fort McKinley assert that the birds were originally liberated about 1918 by a former Post Commander. The species seems to be well adapted to a particular type of terrain and within a restricted area is doing very well; in fact, the birds are sufficiently common on the Fort McKinley Military Reservation to afford excellent hunting. Their present range is the open, grassy country extending from Fort McKinley on the north to about Alabang on the south, and from Laguna de Bay west to the thickly settled district along the Manila South Road. Here they frequent the more open grassland that is broken by scattered clumps of small trees, and are usually flushed from the cogon grass and along the trails.

The males begin to call about the first of February and their crowing can be heard until the rains begin in June. This crowing, however, actually precedes the breeding season, and it is doubtful if any eggs are deposited before May. The nest of the Francolin is a slight depression in the ground, usually very well concealed under a thick tuft of grass; the female sits very closely, and usually flushes within a few feet. The nesting depression is lined with bits of grass and a few feathers. Occupied nests were found from May 3 until about August 15. The eggs number from three to five and the color varies from tan olive drab to light café-au-lait; they average 37.4 x 30.3 mm. in size.

ISLAND PAINTED QUAIL, *Excalfactoria chinensis lineata*.—The beautiful little Painted Quail is commonly found about old rice fields, meadows and open grassland, where it is exceedingly hard to flush, usually bursting up just beneath one's feet. Its flight is sustained by very rapid wing beats and after going a few yards the bird will drop almost vertically to the ground, where it runs swiftly through the grass and can seldom be flushed a second time. Two or three birds are usually found together. It should be noted that this quail is easily confused with the button-quails and identification is almost impossible unless the bird is in hand.

The breeding season evidently extends from June until September; eggs have been found on June 6, and intermittently until September 20. The nest may be found in an abandoned rice paddy, along the edge of a field or in a pasture, where the grass is not over six or eight inches high. It is a slight depression in the ground, lined with fine blades of dry grass, usually so well concealed beneath a bunch of grass or weeds that it is discovered only by flushing the bird. The eggs number from three to six, the normal number being four or five; in color they vary from light to dark olive brown, and are well speckled with chocolate brown. They average 23.4 x 18.8 mm. in size.

PHILIPPINE BUTTON-QUAIL, *Turnix suscitator fasciata* (*Pu-go'*).—The Philippine Button-quail is very similar in habits to the Painted Quail. But, whereas the latter

is more often found along the edge of a rice paddy or in low meadows, the Button-quail keeps to the higher and better-drained ground. It is extremely hard to flush. The flight is short and low, and the bird after covering ten or fifteen yards drops to the ground, whence it can seldom be flushed a second time. In grassland where they are numerous, these quail always have little runways through the grass, which they apparently use in preference to wandering about at random. This habit regularly results in their undoing, for the natives trap hundreds by means of horsehair snares placed in the runways. They are used as food or sold in the markets. Near Calamba the writer found this species especially abundant in fields from which the sugar-cane had just been harvested; four or five birds are frequently flushed close together.

The breeding period begins about the middle of May and continues through the rainy season. Three sets of eggs were collected: one on May 20, 1929, another June 6, and the third on August 26. The set taken on May 20 was in a slight depression, lined with only a few blades of grass, and hidden beneath a small tussock. The two eggs are grayish white, the ground color partially covered with yellowish brown, which in turn is finely spotted with lavender and purplish black. In another set of three, the eggs have the same general appearance, but the gray ground color is nearly covered with a darker shade of yellowish brown; the purple-black spots are about the same shade but appear less distinct against the darker background. All eggs are more heavily spotted at the large end, and average 24.2 x 19.6 mm. in size.

SPOTTED BUTTON-QUAIL, *Turnix ocellata* (*Pu-go'*).—The Spotted Button-quail is easily separated from the other species of the genus by its larger size, though in habits it is similar to the Philippine Button-quail. However, it is not so frequently found on the open grassland, but seems to prefer the patches of low brush bordering the edge of ravines, and broken country that is characterized by scattered bushes and bunches of grass. It also occurs in the bamboo thickets growing at the margin of the rice fields. This species is commonly known as the Mountain Pugo by the natives of Rizal; it flushes more easily than either of the two other quails, and when raised will fly a considerable distance. It resembles the other Button-quails in that the female has very modern and up-to-date ideas; for, after the eggs are laid, the male takes over the incubation duties and cares for the baby chicks, while she promptly seeks out a new mate and begins courting all over again.

The breeding season is doubtless much extended, for eggs have been observed from March until August. The nest is placed on the ground, frequently under a small pile of dead branches or in a group of low, dense bushes. The general location of the site resembles that selected by the American towhee. A typical nest, found March 25, 1928, was located in the center of a small group of bushes and grass about twelve inches high in a low, brush-covered area. The male was shot as he flushed. This nest consisted merely of a depression in which there were a few dry leaves and feathers; it was very well concealed, and partially roofed over by the surrounding grass. In size the eggs average 28.4 x 21.6 mm. They are grayish white in color, so densely speckled with gray, slate and purple as completely to conceal the ground color around the larger end. From two to four eggs are deposited in a nest.

BLUE-BREASTED RAIL, *Rallus striatus striatus* (*Tic'-ling*).—The Blue-breasted Rails are rather common birds in the lower marsh country and about flooded rice paddies during the rainy season. Though seldom flushed or seen, a great many of them are snared by the natives, and they are often found in the markets. This species does not begin to breed until the rainy season is well advanced and there is an abundance of water over most of the lowland and in the rice fields. The first nest

was found on August 15, and the latest, on September 20, but these dates probably mark only the height of the breeding season.

The nest of the Blue-breasted Rail is rather well built and is usually located in the marsh grass of some wet meadow or along the edge of a flooded field; it is either on ground that is covered with a few inches of water or on damp ground in the immediate vicinity of water. It is composed of grass, and may be built up from the ground to a height of one or two inches, or it is woven to the stems of standing grass just off the ground. It is rather well cupped and usually well concealed. The number of eggs laid varies from three to six, the most frequent number being four or five. They are rich creamy white, variously spotted, streaked and blotched with dark red, reddish brown and purple; these markings are lightly sprinkled over the whole surface but are normally heavier around the larger end of the egg. Thirty-one eggs have an average size of 32.7 x 24.4 mm.

PECTORAL RAIL, *Rallus philippensis philippensis* (*Tic'-ling*).—The Pectoral Rail is common in the vicinity of Manila and is snared in considerable numbers for sale in the markets. It is closely associated in habit with the Philippine Rail. Both species are frequently found a long distance from water, ranging through dry grassland and over open hills; the present species, however, stays a little closer to water holes and is less abundant in the higher areas. Both species are difficult to flush, and when driven from cover, fly less than fifty yards before dropping back into concealment; both may be most frequently observed either early in the morning or late in the evening. At such times they like to dust themselves in a deserted roadway and feed along the edge of a cultivated field or clearing; when disturbed, they rarely fly, but prefer to dart back into the grass or bushes.

The breeding period is coincidental with the rainy season. Occupied nests with eggs have been observed on May 15, intermittently until November 17. The nesting site selected by the Pectoral Rail is on low, wet ground in the neighborhood of water or on dry ground close to the edge of a water hole or a flooded rice paddy. The nest is usually rather well concealed under a bunch of grass or weeds. Its construction is variable, sometimes consisting of a slight depression lined with a little grass, at other times it is fairly well built of grass, stems and leaves. The eggs vary in number from three to six. Their ground color is light creamy tan, marked with small spots and specks of several shades of red-brown and purple; the coloring is heavier around the larger end. A small series of eggs averages 35.0 x 27.1 mm.

The eggs of the three species of Philippine rails are easily confounded and the identification of an individual egg is often impossible. Small eggs of the present species may be confused with those of *Rallus striatus striatus*, and the larger eggs with small eggs of *Rallus torquatus torquatus*. In general, however, the eggs of the former are smaller in size, more creamy in color and more heavily spotted than those of *Rallus p. philippensis*.

PHILIPPINE RAIL, *Rallus torquatus torquatus* (*Tic'-ling*).—The Philippine Rail might be more properly called the Land Rail, since it occurs most frequently on high, open prairie, often at a considerable distance from a marsh or other source of water; it was particularly common along the ridges south of Fort McKinley. This rail is frequently found associated with the Pectoral Rail, but is more abundant than that species, and prefers higher, drier localities; few were observed on marshy ground. The general habits of the two species are similar. Both are hard to flush, preferring to run off through the grass, and both are more active in the early morning and in the evening, just before sundown, when they skulk out into open short grass or bare areas to feed. Large numbers are snared for the markets.

The nesting season begins in May and continues until November; nests with eggs have been observed from May 17 until November 10. The nesting site is usually in the grass of some high upland field at a distance from water. The nest is placed beneath a low bush, bunch of grass or tangle of vines, and resembles more the nest of a grouse than that of a rail, merely a scratched-out depression more or less lined with grass. A typical nest was found on May 23, 1928, on a high, dry ridge at least a mile from the nearest source of water. The female flushed at about five steps, disclosing the nest under a small thorn bush at the border of a dense thicket. The nest was six inches in diameter and three and one-half inches deep, the depression formed of grass padded down with some additional grass and leaves for lining. This nest contained three slightly incubated eggs.

The Philippine Rail lays from three to five eggs, creamy tan in ground color, and spotted around the large end with several shades of reddish brown and purple. One set of four has no red or brown markings, but the large end of each egg is colored with deep lavender under-shell markings. In general appearance the eggs of this species are very similar to those of the Pectoral Rail. A comparison of a small series of each shows that the eggs of the Philippine Rail average larger with larger spots that frequently are smeared; also they show more lilac and purple under-shell coloring. Twenty specimens have an average size of 38.4 x 27.9 mm.

RUDDY RAIL, *Porzana fusca fusca*.—Very little is known concerning the habits of this small rail. It was found only in marshy places where the grass was not over ten or twelve inches high, and was very hard to flush; the few specimens collected were birds that were cornered in a rice paddy or similar situation where flight offered the only means of escape. The birds are apparently rather rare, though occasionally snared by the natives; the general habitat and actions remind one of the American Black Rail. However, in his 'Manual of Philippine Birds' McGregor says, "It is usually found in dry brush-land or on forest paths and is extremely quick in making its escape."

The Ruddy Rail doubtless breeds during and after the rainy season. One nest and two eggs, together with the parent bird which was snared, were taken on September 10, 1929. This nest was in a wet meadow where the water just covered the surface. It was very well concealed, rather flat and composed of short bits of reed and grass, and was placed just above the water in grass about eight inches high.

The two eggs average 29.8 x 22.1 mm. They are light creamy white in color, rather glossy and well peppered with light reddish brown; there are a few shell marks of lavender and the speckling is slightly thicker about the large end.

PHILIPPINE ASHY RAIL, *Poliolimnas cinereus collingwoodi* (*Y-a-gul-yul'*).—In suitable situations the Ashy Rail is rather abundant. It is commonly found along the margins of lakes or ponds, on flooded grass farms or in wet marshes characterized by patches of low grass. It is a good swimmer, taking readily to the water, and like other rails flushes only when surprised or when there is no available concealment. The flight is sustained with apparent effort and is of just sufficient duration to carry the bird to the next patch of cover.

The breeding period occurs at the height of the rainy season; occupied nests have been found only during July and August. A typical nest is well concealed and extremely hard to locate. It is a cupped affair about four inches in diameter, of grass, which is woven about the stems of standing grass or rushes usually two or three inches above the ground or shallow water. The eggs, which vary from three to five, are totally different from those of any other species of rail the writer has ever seen. The ground color is light tan, almost obscured by streaks and spots of

light reddish brown, which form longitudinal streaks along the shell; they are in fact very beautiful. The average size is 29.0 x 20.8 mm.

PHILIPPINE WATERHEN, *Amaurornis olivacea olivacea*.—The habits of the Waterhen very much resemble those of the gallinules, except that it shows a distinct preference for the drier portions of the swamps. It is very rare in the vicinity of Manila, and only a few birds were observed.

A nest containing four eggs just ready to hatch was found on September 4, 1929, on a stretch of low, marshy ground adjoining a flooded area. The surrounding grass, which was about two feet high, had been pulled down and twisted together to form somewhat of a cover over the site. The nest itself, measuring eight and one-half inches in diameter and three inches deep, was composed of grass and stems. In ground color the eggs are light cream white, well spotted with red and a few shell stains of lilac, the spots confined mostly to the larger end of the egg. The four average 41.0 x 30.2 mm.

WATER-COCK, *Gallicrex cinerea* (*Can-nu-toc'*).—The Water-cock is one of those inconspicuous birds of the marshland that are more often heard than seen. In suitable localities it is fairly common and the deep-throated call consisting of a series of syllables resembling *tug-tug-tug* is most often heard in the early evening. In habits it much resembles rails and waterhen and when disturbed prefers to run off through the grass but is not particularly hard to flush. The flight is slow and heavy. As a game bird the Water-cock is too slow and clumsy on the wing to afford good shooting but its flesh is delicate and well flavored.

The breeding season probably extends throughout the rainy season. A single nest and three eggs were taken on July 5, 1928. The female flushed at about ten yards, revealing a nest in the thick grass of a wet hayfield. It consisted of a pile of grass, stems and leaves, built to a height of about four inches, slightly cupped on top and lined with grass. The eggs have a ground color of light bluish gray, profusely covered with spots, smears and streaks of several shades of brown and a few stains of lavender. They are beautifully marked specimens and in general appearance resemble well-marked eggs of some of the Accipiters. The three eggs average 44.7 x 32.6 mm.

LUZON GALLINULE, *Gallinula chloropus lozanoi*.—The Luzon Gallinule is apparently a widely distributed species, and is abundant in all suitable localities. Its most ideal habitat conditions are found in those shallow lakes and ponds that are overgrown with patches of reeds and bushes or covered with water hyacinths and lily pads. It is considered a very desirable game bird, and is usually hunted from a boat.

As in other marsh-inhabiting species, the breeding period extends throughout the rainy season, and occupied nests were found in July, August and September. Breeding birds were especially abundant near Pagsanjan, at Obondo, and in the marshes along the northern shore of Laguna de Bay. The nest is placed in grass, weeds or bushes in any convenient situation, sometimes just above the water in a bush or bunch of reeds, again on a mass of floating débris. A bird was flushed from one nest that was eight feet above the water in a low tree, but this was evidently an old nest of some small heron, which had been appropriated and lined with bits of grass and reed. A typical nest, found September 16, 1928, was three inches above the water in the thick stub of a bush; the surrounding water was about three feet deep at this point. This nest was seven inches in diameter and two inches deep, and was composed of grass, water-moss and a few bits of reed stems, placed on a base of small twigs. This nest contained three eggs which were slightly incubated. The

Luzon Gallinule usually lays from three to six eggs, varying from grayish buff to olive buff in ground, peppered with small spots of light reddish brown. The spots are more thickly distributed around the larger end in most cases, though a few are evenly colored all over the surface of the egg. In size they average 42.7 x 30.5 mm.

PAINTED SNIPE, *Rostratula benghalensis benghalensis* (*Pa-co'-bo* or *Can-du-ro'*).—The Painted Snipe is an inhabitant of open grassland where the vegetation is not over two or three feet high, though it is frequently found also feeding in the flooded rice fields. The birds are resident wherever found, and are somewhat solitary in habits; only pairs are associated together, though several pairs may be scattered over a large area of marsh. In these birds as in the phalaropes, the female is slightly larger, more brightly marked and does very little of the incubating; at least all the birds flushed from nests were males.

The breeding season seems to be at its height during August and September, a period unfortunately coincident with the arrival of the immense flocks of migrating snipe from China. These are persistently hunted, and many of the breeding "painters" are taken also, since all snipe are game for the hunters.

The nest of the Painted Snipe is placed on the ground in thick grass or on the edge of a dike between two rice paddies. The male sits very closely and is usually flushed within one or two steps, uncovering a nest that is rather flat and consists of only a few pieces of grass and stems. Two or three eggs are laid; these vary from clay color to light olive in ground, and are well covered with spots and blotches of blackish brown. When fresh they are very beautiful specimens but they quickly become mud-stained and faded. Five sets average 38.5 x 26.6 mm.

ASIATIC RINGED PLOVER, *Charadrius dubius dubius*.—This species is not uncommon in suitable localities; two or three pairs are commonly found associated together on bare, gravelly flats along the larger streams. The protective coloration of these small plovers is such that they are very difficult to see, and they are seldom observed unless one is particularly watching for them. They rarely take flight except when closely pressed, but prefer to run off and hide among the larger stones.

The breeding season probably extends from February to April or May, since available nesting grounds are usually flooded soon after the rains begin. Upon several occasions the writer found pairs he felt certain were nesting, but was never able to locate the eggs. Two young birds about a week old were taken April 17, 1929, on a gravel bar along the Pasig River near San Tolan.

EASTERN SWALLOW-PLOVER, *Glareola maldivarum*.—The Swallow-plover is seldom seen except on the wing, and inasmuch as it resembles both a tern and a swallow in flight it is very hard to identify until one becomes familiar with the species. This bird has been known only as a migrant in the Philippines, hence the writer was very much surprised to find two distinct breeding colonies in the dry fields near Taguig, Rizal Province.

Several birds were first observed on April 25, 1928; their actions were those of breeding birds, and several specimens were collected which had enlarged sex organs. However, as several hours of searching failed to disclose anything that looked like a nest, it was finally concluded that these were merely late migrants. The following year, on April 20, 1929, Swallow-plovers were again found near the same locality. A prolonged search this time resulted in the discovery of a breeding colony of about thirty pairs. This colony was scattered over about fifty acres of dry rice land; the stubble had been partially burned and elsewhere pastured so closely that the ground was practically bare. Nests were placed on the bare ground with no cover or con-

cealment whatever, and consisted of only a slight depression. In some cases this had been scratched out by the birds, in others, the old hoof-marks of animals or other existing depressions had been used; no nest lining was found in any nest.

Another colony of about twenty pairs was found a few days later about half a mile from the first on an open, plowed field; a few nests were scattered along an adjacent tomato patch. The nesting depressions were all similar to those of the other colony; no nests were found very close together, but usually averaged from fifteen to twenty yards apart.

At their nesting grounds the actions of these birds resemble those of the avocets. They leave their nests at the first sign of disturbance, and circle about or hover overhead, occasionally diving at the intruder. All the birds of the colony seem to join in this, contributing to the general commotion with their yelping alarm notes. Sometimes a bird will alight on the ground, fall over on its side and, with wing and leg outstretched, flutter about as though in a death struggle.

Fresh eggs were found on April 20, and nests with eggs were observed until May 30. Two or three constitute a set, more frequently the former; their color varies from grayish white to olive white, and they are speckled, streaked and spotted with blackish brown, slate and a little lavender. Different sets of eggs show very little variation either in ground color or in markings, and average in size 32.0 x 24.2 mm.

NORTHERN WHITE-EARED PIGEON, *Phapitreron leucotis leucotis* (*Ba-to ba-to*).—The White-eared Pigeon is normally an inhabitant of the thickly wooded areas, but occasionally strays into the more open country. It keeps well to the thick foliage and is seldom seen very far from the ground, although it is not a ground-inhabiting species. The flight is not prolonged, and the birds may be distinguished in flight by their rather short and rounded wings.

Two nests of this species were found on the Fort McKinley Reservation. One, located May 30, 1928, was fourteen feet from the ground in a low tree. It was small, very frail and composed of twigs, criss-crossed on the supporting branchlets at the end of a horizontal limb. The brooding female sat very close and could be approached within five feet. This nest contained one white egg which showed signs of heavy incubation and measured 30.1 x 21.0 mm. The other nest was found on May 12, 1929, about twelve feet from the ground in a small tree bordering a dense woods; again the bird sat very close, flushing only a few feet over the writer's head. This nest contained two eggs, also white, and scarcely distinguishable from eggs of *Streptopelia*. The three eggs average 29.0 x 21.1 mm.

BLACK-CHINNED FRUIT PIGEON, *Leucotreron leclancheri leclancheri* (*Ca-pil'-la*).—The Black-chinned Fruit Pigeon is common in the wooded hills of eastern Rizal Province. It is usually encountered in pairs that never habitually stray far out into cleared areas, though occasionally a bird is seen flying across a valley or a clearing from one woodland to another. The protective coloration of this pigeon is so effective that, unless it is seen on the wing and followed into a particular tree, it is almost impossible to separate it from the surrounding green foliage. It is common belief among the natives that these birds are a cross between the Brown Dove and a green parrot.

The writer's only breeding record is based on a single nest, found east of Taytay on April 24, 1929. The female was collected as she flushed from this nest, which was located on a horizontal branch about twenty-five feet from the ground in rather open woods. The structure was composed of a few loosely placed twigs, and contained a single, plain-white egg. This was partially incubated and measures 33.0 x 22.7 mm.

DUSSUMIER'S TURTLE DOVE, *Streptopelia bitorquata dussumieri* (*Ba-to ba-to*).—This Turtle Dove is an inhabitant of open country and is rarely seen in the wooded districts. It was found to be rather generally distributed throughout the lowlands but not particularly abundant in any one locality; its habits are similar to those of the Red Turtle Dove, from which it is readily distinguished in the field by its much larger size. The breeding period is doubtless very much prolonged, as is that of all doves in the Philippines, March, April and May constituting the breeding season in the vicinity of Manila.

The nest of the Dussumier's Turtle Dove is a frail, loosely constructed platform of twigs, usually placed on any convenient horizontal branch not over thirty feet above the ground. On May 5, 1929, a flushing female—which was taken—revealed a rather typical nest of the species near Arayat. This nest, about twelve feet above the ground in a low tree growing at the edge of a marsh, was a loose affair of a few twigs and vine tendrils in the slender branchlets of a small limb. The eggs could be readily seen from below.

There are usually two eggs, which are clear white and entirely lack the creamy tinge characteristic of eggs of the Red Turtle Dove. A small series averages 30.1 x 20.3 mm.

RED TURTLE DOVE, *Streptopelia tranquebaraca humilis* (*Ba-to ba-to*).—The Red Turtle Dove, like the Dussumier's Dove, is a bird of the open country, where a hillside covered with cogon grass and scattered patches of brush or trees affords ideal habitat conditions. In such localities these birds are often very numerous, associating with Dussumier's Dove but occurring much more abundantly. Both species are often seen feeding on the ground in dry rice fields, and are persistently trapped for the markets.

The breeding season is much prolonged, and extends at least from February until June, these months limiting the period in which eggs or young were found. However, in the vicinity of Manila, the months of March and April witness the height of breeding. The male is a gallant lover during the mating, when he frequently takes a perch close to the female, and with distended throat and crop bobs up and down repeatedly, all the while uttering a soft, cooing note. These notes are repeated five or six times in succession, and may be described as *cu cu-cuu cuu;* they are followed by a pause of three or four seconds and then repeated anew.

The nest is a very frail platform placed on a horizontal branch or in the heart of a spray of new twigs; it is usually about three and a half inches in diameter and composed of twigs and vine tendrils. All nests observed were within thirty feet of the ground. Two eggs constitute a normal set; these are white with an ivory or creamy-yellow tinge, and average 25.1 x 19.9 mm. in size.

BARRED GROUND DOVE, *Geopelia striata striata* (*Ba-to ba-to ca-tic'-bi*).—The Barred Ground Dove is the smallest of the Philippine doves. It frequents open country, fields, gardens and parks, and is often observed feeding on the ground along the roadside. The species is common throughout all the lowlands of western Luzon, and is especially abundant and tame at Fort McKinley where it is never molested.

The breeding season extends from about February until June; fresh eggs are found from February 16 until May 28, though individual pairs probably nest in nearly every month. The nest is placed in any convenient crotch or on some horizontal branch of a low bush or tree usually not over fifteen feet from the ground; it is always frail, being ordinarily composed of only a few twigs or grass stems. A nest found near Dagupan, Pangasinan, on February 16, 1929, was eight feet from the ground in a small coconut palm. It was placed between one of the broad leaf-

stems and the main trunk, and consisted of only a few bits of grass. The eggs are usually two in number, clear white, and average 22.6 x 16.9 mm. in size.

RED-WINGED COUCAL, *Centropus viridis* (*Sa-ba-cot'*).—This is the best known and most common of the Philippine coucals. Though abundant in suitable localities, it is not often seen except during the mating and breeding season, when it is particularly active in the late afternoons. At such times the birds are encountered along little-used roadways or climbing about through the grass or bushes, where doubtless their principal food of lizards, ants and possibly termites is found. When disturbed, they prefer to slip away through low bushes rather than take wing, and if forced into the air fly only a short distance.

Mating activities begin some weeks before the rainy season, but the nest is not actually built until the rains are well along, and the new growth of green grass is two or three feet high. This nest is commonly placed one or two feet above the ground in the thick grass of an open area, and is built of green grass-blades woven into a dome-shaped structure. It is generally supported by the standing stems and is so well concealed that it is almost impossible to distinguish it from an ordinary bunch of grass.

A nest found on June 10, 1928, was situated two feet above the ground in thick grass, growing about three feet high, and was only discovered because it was noticed that the tops of some of the grasses had been pulled down and bent over the structure. This was a typical dome-shaped affair, eight inches high and five inches in diameter with a single entrance about midway along the side; it was rather loosely constructed of wide grass-blades, which were woven about the standing stems. The surrounding green grass had been pulled down and worked around the nest to form most of the top and part of the sides of the dome. It was lined with grass and a few green leaves, the latter apparently added after the three eggs were laid.

The Red-winged Coucal lays two or three eggs, which are white in color, rather rough grained and coated with a chalky deposit. A small series of eggs averages 29.4 x 24.7 mm.

GRASS OWL, *Tyto amauronota* (*Cua-gong ta-la'-hib*).—The Grass Owl inhabits open grassland, and may be found either on the open plains or in any area of marshland that remains unflooded. The birds are not at all uncommon, and one or two can usually be flushed in suitable country; they are resident wherever found, and apparently well distributed over the island. In habits, this species most resembles the Short-eared Owl, frequenting the same type of terrain and nesting on the ground. However, since small mammals are so rare in the Philippines, its food runs chiefly to snakes, lizards and frogs.

Grass Owls were frequently flushed along the prairie ridges south of Fort McKinley, but in each case a search for the nesting location proved futile. However, while engaged in maneuvers in this district on December 18, 1929, one of the sergeants in the writer's company flushed an owl from a nest containing two eggs. The writer was at that time confined in the hospital but the location was marked and the site was visited at the earliest opportunity, which was about two weeks later. By this time the nest had been broken up and the birds had disappeared, but the nest was found—apparently only a depression lined with grass stems in the thick grass of an open situation.

PHILIPPINE NIGHTJAR, *Caprimulgus affinis griseatus* (*Tu-ca'-ro*).—This species is the smallest of the Philippine nightjars. It is very local in occurrence and rather rare, even in typical habitat situations, but is most likely to be encountered on a dry,

sparsely grown ridge or along some open, sandy beach. In central Luzon the normal breeding period extends from about the first of April until the beginning of the rains; occupied nests were recorded for March 21, May 2 and June 6. The immediate site chosen is usually a bare, sandy place, though frequently the nest is placed on an outcropping stratum of rock or among scattered stones; there is never any attempt at cover or concealment for either eggs or nestlings. Several birds have been flushed just back of the high-water line along the beach.

The eggs are deposited in a slight depression and there never is any pretense at nest building. The brooding nightjar normally sits very closely on the eggs, permitting one to approach within one or two steps before it takes wing. The usual complement of eggs is two. These have a ground color which varies between gray and pale, creamy white, spotted and scrawled with slate and pale lilac; there are a few under-shell markings of gray. Four sets average 27.7 x 18.4 mm. in size.

MANILA NIGHTJAR, *Caprimulgus manillensis* (*Tu-ca'-ro*).—The Manila Nightjar can scarcely be separated from the Philippine Nightjar in the field, but the habits of the two are so totally at variance that any nightjar flushed from thick cover can be assumed to be of this species. In his 'Manual of Philippine Birds,' McGregor observes of this species: "The Manila nightjar is the most common of its genus in the Philippines, and has a considerable vertical range, being found in the pine woods of Benguet Province as well as in the lowlands and near the sea. Its food consists largely of moths and beetles which it takes on the wing. During the day it rests in dark thickets and comes out to feed only after sunset." The writer has found this bird most often in dense bamboo thickets, where it spends the day resting on the dead leaves beneath the overhanging branches; it is rather difficult to flush, and when disturbed during the day flies only a short distance. These birds are most often observed feeding on the wing just before dark.

The usual nesting period for this species is during April and May; fresh eggs and young birds just able to fly have been taken on May 10. The nesting site is on the ground in a dense bamboo thicket and is usually protected by dead branches or a small heap of dry brush. Strictly speaking, there is no nest; the eggs are merely deposited in a slight depression in the leaves. A typical "nest" was found on May 9, 1928, in a well-shaded spot between two small thickets of bamboo and beneath a small heap of dead branches. The female flushed almost underfoot, uncovering the two eggs in their shallow depression among the bamboo leaves.

The Manila Nightjar normally lays two eggs, gray in ground color with a tinge of creamy white; this is marbled and clouded with slaty gray and lavender. A small series of eggs averages 28.9 x 21.3 mm.

Several ornithologists have recently classified this species as one of the geographical forms of the *Caprimulgus macrurus* group. While it is appreciated that the coloring of eggs is rarely considered important in separating species, nevertheless, in this case the eggs of the two forms differ so greatly that it seems unlikely that there can be any subspecific relationship between them. The writer has examined a considerable series of eggs of the various forms of *Caprimulgus macrurus*, including specimens from Java, Palawan and several localities in India. These eggs all show a basic ground color of pinkish salmon, which persists through all the individual variation of the different sets. The eggs of *Caprimulgus manillensis* have a grayish or light creamy ground color and in the writer's series of eighteen eggs taken near Manila, not a single specimen has any hint of the pinkish-salmon coloration, but all are so distinctly different from any of the eggs of the *Caprimulgus macrurus* group that subspecific relationship appears impossible.

SALVADOR NIGHTJAR, *Caprimulgus macrurus salvadori*.—This nightjar is not a resident of Luzon, but it is desired to make use of this opportunity to record the description of two eggs of this form which were taken in Palawan. This set of eggs was presented to the writer by Dr. Alfred Worm, who was formerly a dealer in birds and wild animals in Manila; it had been collected by him together with the parent bird near Guinlo, Malanpay Sound, Palawan, on July 2, 1927. The eggs were in a slight depression among dry leaves in a dense patch of brush. They have a ground color of light salmon, and are slightly clouded with gray and pale lilac; they measure 32.0 x 22.5 and 29.0 x 21.8 mm.

WHITE-THROATED KINGFISHER, *Halcyon gularis gularis* (*Til-ma-ma-noc'*).—This is one of the most strikingly colored birds of the tropics; its red and blue coloration render it easily recognizable at a considerable distance. The birds are fairly common in all suitable localities in central Luzon, and are most frequently observed along the larger streams or the shores of the freshwater lakes. In districts where fish-farming is carried on, they are often to be seen perched around the fish pens, and are a source of great annoyance to the natives. This species is rarely found along the small streams frequented by the White-collared Kingfishers.

The White-throated Kingfisher probably breeds all through April and May. A single set of two eggs was taken April 7, 1929, from a hole in a low bank, located at the edge of a small stream but close to the shore of Lake Taal and about a mile east of the barrio of Talisay, Batangas Province. The nesting hole had evidently been excavated by the birds; it was three inches in diameter and extended back some thirty inches. The end of the burrow was somewhat enlarged, and the eggs were surrounded by a small quantity of fish scales and bones. They are nearly round, pure white and glossy, averaging 31.6 x 27.6 mm. in size.

LINDSAY'S KINGFISHER, *Halcyon lindsayi lindsayi*.—This kingfisher is rather rare. A few specimens were taken along streams in the mountains of Cavite Province, but the bird was not observed in any other locality.

The only known egg of this species is one presented to the writer by M. Ligaya; it was taken from the oviduct of a female he shot in Cavite Province on May 12, 1929. It is pure white with a slight amount of gloss, and is more pointed than any egg of this genus ever seen by the writer; in size it seems to be unusually large by comparison with the size of the bird. This egg measures 36.0 x 27.5 mm.

WHITE-COLLARED KINGFISHER, *Sauropatis chloris collaris* (*Tick-a-rol*).—This is the most abundant kingfisher in central Luzon. It frequents small streams and shallow pools that are not too thickly grown up with vegetation, and is often perched on a bamboo pole or convenient dead branch overhanging the water. Indeed, it is not averse to appearing in parks or gardens at a considerable distance from a suitable feeding place; and, during the mating and breeding season, White-collared Kingfishers are often observed a long distance from any water whatever. At such times their actions resemble those of any passerine species.

During this period they are very active and noisy and perform an interesting mating ritual. One bird will leave its perch in a tree and fly to the ground; then it will fly back into the tree and then, perhaps, to the ground again. Meanwhile, a short distance away in a tree or on the ground, its mate views this performance, while both birds join in a harsh, incessant chattering. After a short time both may take part in this heated tree-to-ground ceremonial, or one may sit out a round or two and cheer the other on. Such behavior by kingfishers was a source of bewilderment to the writer until it was discovered that they were nesting in trees, either in a

natural cavity or in a mud termite nest. The latter seemed to be in greatest favor and all such nests observed were from twenty to forty feet above the ground. It is not known whether the birds select occupied termite nests and then proceed to clean them out or simply preempt some deserted nest. However, the general procedure remains the same: a hole two or three inches in diameter is cut in the side of the mud nest, the inner compartments of the insects are broken down and the shell is cleaned out. The eggs are then deposited on fine particles of earth, well mixed with fish-bones, scales and the remains of termites. No real nest lining was ever found.

The normal breeding period is during the latter part of April and May; eggs have been found on May 2 and upon intermediate dates until June 6. Well-developed young were observed on May 16. The eggs number from three to five, are nearly round and pure glossy white; a small series averages 28.5 x 23.7 mm. in size.

CHESTNUT-HEADED BEE-EATER, *Merops viridis americanus* (*Pe-ric'*).—The Chestnut-headed Bee-eater is not as commonly observed as the Green-headed form but the habits of the two are similar, and they occasionally flock together. Both feed wholly on insects caught on the wing. While the two are not readily separated in the field, the characteristic long tail and bright coloration are sufficient to identify the genus. Both breed in small colonies and excavate nesting holes in the ground; but the nesting sites of the two species are decidedly different. The present species digs its burrow on comparatively level ground, usually selecting a plowed hillside where the soil is a little sandy. If the slope is sufficiently steep, the burrow slants directly upward from the opening and then levels off for the nesting cavity; if the ground is flat, the burrow first slants downward a foot or two before turning upward to the nest.

The writer had his first experience with the nesting of the bird on April 7, 1929, when a small colony was discovered breeding in the hills north of Talisay, Batangas Province. The birds had been noted in a plowed field, but were not suspected of their burrowing propensities until one was observed to alight on the ground and immediately disappear. Investigation revealed a colony of ten or twelve pairs. The burrows were scattered a good deal with no two very close together; to the casual observer they might appear to be the burrows of some small mammal. A typical nest had an entrance three inches in diameter and a tunnel extending back thirty-two inches, with a gradual upward slope; this was leveled off, slightly enlarged and rounded at the end for a nesting compartment. The eggs were resting on fine, soft earth, and there was no nesting material in evidence.

The Chestnut-headed Bee-eater lays from three to five eggs, which are pure white and have a high polish. A small series averages 23.1 x 20.5 mm. in size.

GREEN-HEADED BEE-EATER, *Merops superciliosus philippinus* (*Pe-ric'*).—This bee-eater is a common breeding species in central Luzon and, while its actions and feeding habits resemble those of the Chestnut-headed form, the writer has never found it nesting in a field. All colonies observed were nesting in burrows excavated in perpendicular banks. They are most common along the larger streams, and nest preferably where there is a sandy flood-plain with perpendicular banks bordering the watercourse. The female sits very closely, and can usually be captured when the hole is dug out.

The breeding period occurs principally in April. A typical nesting colony examined near San Tolan, Rizal, on April 17, 1929, consisted of about twenty pairs. The burrows were within a foot or two of the top of a low bank, with openings two to three inches in diameter. Several nests were dug out and it was discovered that the tunnels extended almost horizontally inward for an average of about four feet; in each instance the end was enlarged and rounded into a suitable nesting cavity.

From three to five eggs were laid on fine soil; they were nearly round and glossy white with an average size of 22.7 x 20.2 mm.

FORMOSAN SKYLARK, *Alauda gulgula wattersi*.—This skylark is common in the vicinity of Manila from September until about April, when the majority seem to migrate northward and it is a rare breeding species. It frequents the same open grassland and dry fields as the Malay Pipit; both flock together and their habits are similar.

A nest and two eggs taken on May 20, 1928, near Angelas, Pampanga Province, was in an open, sandy field—a slight depression at the side of a tuft of grass, scantily lined with a few dry blades. The eggs are greenish white, spotted with light yellowish brown, and have a few pale lilac stains; they average 21.5 x 16.5 mm.

PHILIPPINE BUSH LARK, *Mirafra javanica philippensis*.—The Philippine Bush Lark is rather common in suitable localities, and is usually encountered in open fields and grassland, particularly in dry areas that have been closely pastured and where the grass is only a few inches high. It was rarely found in cultivated districts or in tilled fields. Unlike most ground-dwelling species, it never attempts to run off or hide in the grass when disturbed, but immediately takes flight. In many respects it resembles the larks, and like the Skylark it sings while on the wing. The notes are rather short but very pleasing.

The breeding season extends from April until June. The nest is placed on the ground and is generally well concealed in grass from three to six inches in height. The sitting bird is very shy and wild, and can rarely be flushed from the nest, which it leaves at the first approach of danger.

The eggs of this species are similar to those of the Malay Pipit, but may be distinguished by being more rounded, with the spots larger and more distinct. They have a light bluish-gray ground, speckled with slate, blackish brown and lavender, and normally two or three constitute a set. Twenty specimens have an average measurement of 19.7 x 15.6 mm.

CHINESE BANK SWALLOW, *Riparia paludicola chinensis*.—The Chinese Bank Swallow is a rather rare breeding species in central Luzon, but is occasionally met with in suitable places. The sandy banks along rivers and streams afford the proper nesting sites, and a few birds are likely to be found about such places. They are most frequently observed in late afternoon, darting low over the water and adjacent fields after low-flying insects, when the characteristic flight of the genus is a ready means of identification. These birds further exhibit the traits of swallows by nesting in colonies of from two to twenty or more pairs. The nesting burrows are always within a few feet of the top of the bank and extend horizontally inward for several feet, where they are terminated by the nest proper. While most of these holes are excavated by the parent birds, the swallows were nesting close to bee-eaters in all colonies examined, and some of the nests were in larger holes that were probably the work of bee-eaters.

The breeding season extends through March, April and May. A typical nest found on May 4, 1929, near Pasig, Rizal Province, was in a colony of about ten pairs of swallows and five or six pairs of bee-eaters. This burrow was in a low, sandy bank along the river, and measured two inches in diameter and thirty-eight inches in depth; the nest of rice-straws, bits of grass and a few rootlets was lined with feathers, and occupied a slight depression at the end. The three eggs are pure white and average 15.3 x 11.15 mm.

PHILIPPINE ORIOLE, *Oriolus chinensis chinensis*.—This is one of the most showy

birds of the Philippines, its strikingly contrasted black-and-yellow plumage rendering it a conspicuous and easily recognized species. In central Luzon it is found rather commonly about clearings and wooded areas in the agricultural districts, but remains well away from human habitation. The flight is somewhat low and consists of a series of dips like that of the American Goldfinch. This oriole has a wide variety of notes and calls, none of which could be termed a song; the alarm note is a coarse *me'auw*, and sounds just like a domestic cat.

The breeding period normally extends through April and May, but may extend into June. A number of nests were observed, all located at a rather low elevation, and suspended from the forking outer branches in true oriole style. The nest is a rather shallow one, six or seven inches in diameter, composed of strips of fiber, grass, fragments of bamboo leaves and strips of fine bark. These are twisted and woven together, and looped securely over the supporting twigs in several places; the nest-lining invariably consists of vine tendrils and small rootlets.

The Philippine Oriole lays two or three eggs which are pure white, rather boldly marked with spots, scrawls and smears of black, with a few shell stains of lilac. These eggs vary a good deal in size, but a small series averages 33.6 x 25.5 mm.

PHILIPPINE CROW, *Corvus coronoides philippinus* (*Wak*).—The Philippine Crow is a well-distributed species throughout most of the inhabited parts of Luzon, where it is particularly partial to coconut groves, and is reported to do some damage to young coconuts. Though of wide range, it is not especially common in any given locality, and was never observed except as pairs or single birds.

All nests of this species were found in April. Philippine Crows have previously been reported as nesting in coconut palms, but all nests examined were in isolated trees standing in open grassland. The actual location of the nest in the tree and its construction are especially noteworthy; it is shallow and loosely constructed, and is always found in the small outer forks where the foliage is thin, as far from the main trunk as possible. This habit is in direct contrast to that of all species of crows breeding in the temperate zones, where the nest is normally placed in the main forks of the tree, and is deep and compact.

The nest of this species is a rather small, flat and loosely arranged affair, composed of small sticks, stems and twigs, and lined with a few rootlets. Three or four eggs constitute the normal set, though one very unusual set of six was found. These are of the usual *Corvus* type, having a bluish-green ground, thickly covered with spots of dark slaty brown and ashy gray; the average size of a small series is 43.3 x 29.4 mm.

PHILIPPINE BULBUL, *Iole gularis gularis* (*Tam-si*).—The Philippine Bulbul is widely distributed throughout central Luzon, and was found to be equally common about Laguna de Bay and in the highlands of Benguet Province. It has a decided preference for the upper branches of medium-sized trees, and is most often observed in small flocks about clearings close to dense forest, where it feeds on wild fruits and berries. It was rarely found in the cultivated districts and seems to avoid human habitations.

A single nest and two eggs, together with the female bird, were secured for me by M. Ligaya near Talisay, Batangas Province, on April 12, 1929. The nest was located about twenty feet above the ground in a small tree at the edge of a dense forest. This nest was four and one-half inches in diameter and three inches deep; it was composed of twigs, plant fiber, dry bamboo leaves and bits of grass, and was lined with rather coarse tendrils.

The eggs of this species are of the usual bulbul type—similar to those of the Guava Bulbul but slightly darker. The pinkish-white ground color is nearly obscured by a

speckling of red brown and a few lilac marks. The two eggs measure 24.4 x 18.8 mm. and 23.5 x 18.7 mm. respectively.

GUAVA BULBUL, *Pycnonotus goiavier goiavier* (*Luc-lac* or *Cul-cul*).—The Guava Bulbul is one of the most common birds in the vicinity of Manila, frequenting the low bushes and vines bordering roadsides, open fields and gardens. It apparently prefers the association of man, and, unlike the Philippine Bulbul, is never found very far from the cultivated areas. Two or three pairs may occupy the same brush-thicket or garden, but the birds were never observed in flocks; they are rather noisy, especially when nesting, but—beyond a variety of short notes—have no proper song.

This species probably breeds throughout most of the year for young birds have been observed in February, and nests with fresh eggs, every few days from March until August. The favorite nesting sites are in low bushes or trees bordering on a field or in patches of brush and vines, but many nests were found in egg-plant, tomato and bean vines in vegetable gardens. A few were observed in low trees but never more than fifteen or twenty feet above the ground.

The nest is rather loosely constructed of plant fiber, strips of bamboo leaves and grass, and is lined with rootlets or small stems. Two or three eggs are the usual complement, four being rare. These are pinkish white, mottled and spotted with light red and a little lavender, so that the general coloration is a strawberry red. A small series of eggs averages 20.7 x 15.6 mm. in size.

DOMINICO, *Copsychus mindanensis* (*Do-mi-ni-co*).—The Dominico is not a very common bird in the area considered, but it is very distinctive and could scarcely be confused with any other species. It frequents brushy areas, particularly where there are clumps of thick bamboo, and is most often observed on the ground or close to it. When disturbed, it will run along the ground or fly into a low bush, where it exhibits a nervous trait of jerking its tail up and down, simultaneously opening and closing it. Its habits and attitudes are similar to those of the American Towhee.

One nest with a single egg of this species was taken on May 24, 1929, but the female, having been disturbed several times, finally deserted before the set was complete. This nest was about eighteen inches from the ground in a thick clump of bamboo shoots, and was constructed of grass, leaves and plant fiber and lined with rootlets. The egg has a ground color of light bluish green, heavily marked with spots of slaty brown, tending to form a series of more or less longitudinal stripes; it measures 21.2 x 16.7 mm. in size.

PIED STONECHAT, *Pratincola caprata caprata* (*Si-pao*).—The Pied Stonechat is fairly common all through the central lowlands, but was not recorded from the mountainous districts. It is most frequently seen either on the ground or in a low bush in open fields or grassland, but never occurs in thick woods or forest land. The favorite habitat is a dry hillside, studded with two or three deserted termite mounds which the birds appropriate as perches. During the breeding season mated pairs are often found. The two birds appear to be much attached to each other and, even when the female is incubating, the male is usually to be seen on a lookout perch a few yards away.

The nesting period extends from late March until June. The nest is placed in a small hole, pocket or cup-like depression in a road-embankment or gully; occasionally it is found a few inches back in the hole, but the majority observed were fully exposed, and located just over the top edge of the bank. The birds never make a nesting hole but select any suitable niche that will hold the nesting material. Several nests were found in small holes in the sides of deserted termite mounds.

A typical nest examined on May 15, 1929, was in a small pocket just over the edge

of a sandy bank along the Pasig River; it was three inches in diameter and two and a quarter inches deep, and was composed of grass roots, lined with fine rootlets and a few hairs. There are normally two or three eggs; these are light blue, spotted and peppered with light reddish brown, the spots thicker and more numerous around the larger end. Twenty specimens average 16.6 x 13.5 mm.

STRIATED MARSH WARBLER, *Megalurus palustris forbesi* (*Su-nod ca-lo-bao*).—The Striated Marsh Warbler is an abundant species in the vicinity of Manila and throughout the lowlands of central Luzon; it occurs less commonly also in the highlands of Benguet Province. It inhabits open fields, grassland, marsh, or areas of low brush, and is frequently observed perched on some dry stick or flying low over the cogon grass. When disturbed it takes refuge in thick grass or brush, running or climbing about through thick cogon with apparent ease. The brown plumage and long tail render the species easily identifiable in the field, and to one not familiar with Philippine birds, it at once suggests the American Brown Thrasher.

The female is somewhat retiring and keeps well to cover, but the male is restless and noisy, especially during the breeding season; he has the habit of mounting thirty or forty feet in the air, then sailing to the ground on set wings, all the while broadcasting his unmusical repertory of short *chucks* and calls. At other times he selects a perch atop a bunch of tall cogon grass and makes a serious attempt to sing, but the result is equally coarse.

The breeding season in the vicinity of Manila extends from about February until July; birds were observed carrying nesting material on January 27 and either young birds or eggs were recorded regularly until July 14, when a nest with fresh eggs was taken. The nest is normally placed in a small, isolated bunch of grass, attached to the upright stems, and though one nest was observed on the ground, most of them are from six to thirty inches above it. A single record of one found about four feet high amid the leaves of a bejuco palm was made. The nest is a globular structure of rather coarse stems and thick grass-blades, which are loosely woven around the upright stems, arched over the top and tucked in again on the side to form a ball six or seven inches in diameter. There is little real lining within the nest but a few short pieces of grass, arranged on the bottom, are just sufficient to prevent the eggs from slipping through; the single entrance is on the side and close to the top.

The Striated Marsh Warbler lays two or three eggs; these have a ground color of gray, thickly peppered with darker gray, slate and light brown with an occasional splash of lilac. Despite some variation, all exhibit these same general characteristics. Twenty specimens have an average measurement of 21.8 x 16.8 mm.

GOLDEN-HEADED CISTICOLA, *Cisticola exilis rustica* (*Pit-pit*).—The cisticola, though not uncommon, is rather difficult to observe because of its seemingly restless trait of darting back and forth through the thick grass of its haunts. Appearing abruptly out of a mat of thick grass, it fidgets and scolds a moment, then vanishes quite as suddenly, only to reappear an instant later a few yards farther on. It is found only in areas of thick, dense grass, particularly where the ground is matted with the broken-down growth of the previous season. In both habits and actions the species resembles the American Short-billed Marsh Wren (*Cistothorus stellaris*).

The breeding season extends from about May to July. The nest is placed two or three feet above the ground in dense growth of grass and consists of a ball of soft grass lined with bits of the same material, with an entrance on the side.

Two or three eggs are laid. These are characterized by a clear white shell, peppered with light red and a little lilac so as to form an irregular wreath about the larger end. Five specimens average 15.4 x 11.5 mm. in size.

PHILIPPINE GERYGONE, *Gerygone fusca sulphurea*.—"This little flycatcher closely resembles the species of *Zosterops* in habits, but it is less common in occurrence. At times small flocks are found feeding in clumps of bamboo or in high mangrove thickets. It has a pleasing note by means of which the members of a flock are kept together. In its active movements from tree to tree it resembles the titmice, but we have never found *Gerygone* in forests." This account from McGregor in his 'Manual of Philippine Birds,' is very characteristic of this species and need scarcely be enlarged upon; however, it might be added that the flocks disband during the breeding season, when the nesting pairs seem to prefer open, brushy hillsides or brushy, reclaimed clearings.

A female, together with her nest and two eggs, was taken on April 22, 1929, and another nest and two eggs, on May 28, 1929. The first was about fourteen feet from the ground in the outer spray of a small tree; and the second, about twenty feet high at the extreme tip of a large mango branch. The nest itself is a purse-shaped affair with entrance on the side, and is made up of fine grasses and plant fibers with plant cotton, spider webs and tiny cocoons, all so closely woven together as almost to approach coarse cloth in texture. The supporting fibers are looped over the tips of small twigs in such a manner that the nest resembles a dangling scrap of old bark; the nest-lining is of soft plant cotton and a few feathers.

The pure white eggs are finely peppered with red, which occurs much more profusely about the larger ends; the four average 16.8 x 11.4 mm. in size.

BLACK AND WHITE FANTAIL, *Rhipidura javanica nigritorquis* (*Ma-ri-a cong*).—The Black and White Fantail was observed to be common in all localities not characterized by dense forest. Its favorite haunts appear to be the scattered clumps of bamboo which occur on the borders of rice paddies or along the edge of a stream. Habitually nervous and inquisitive, this fantail is constantly on the move, hopping from one twig to another, and all the while alternately spreading and jerking its tail. While not a bird of the forest, it prefers shaded nooks and is usually found under thick bamboos or in the lower branches of large mangos. Like other flycatchers, its food consists mostly of insects, taken on the wing. Both parents are conspicuous and noisy in the vicinity of their nest, and their scolding is frequently the first indication that a nest is near.

The principal breeding season is during April and May, though occupied nests were observed until June 9. The nest is always situated in a well-shaded spot, most often saddled on the forks of a dead branch from five to thirty feet from the ground and several feet away from the nearest foliage; it is amply protected and shaded by the surrounding clumps of bamboo. Normally cup-shaped and about three inches in diameter, it is compactly and very artistically built of bamboo fibers and strips of bamboo leaves, bound together with fine fibers, spider webs and bits of grass. The outside is festooned with spider webs and dead leaves and appears to be an old bit of drift or a tangle of cobwebs and leaves. The inside is well lined with fine fibers and hairs.

The Black and White Fantail lays two or three eggs. These have a ground color of cream white, peppered with spots of yellowish brown and a few specks of lavender, which often tend to form a band or wreath about the larger end. Twenty-five specimens average 18.6 x 13.7 mm. in size.

MALAY PIPIT, *Anthus rufulus malayensis*.—The Malay Pipit is a resident species in central Luzon and is very common throughout the year. It is most often seen on the ground in dry rice fields, and after the rice is harvested flocks of several hundred are not of uncommon occurrence in such places. Early in March these flocks break up

into breeding pairs, which scatter throughout the dry rice fields in search of nesting sites; they never nest in colonies, but several pairs are usually found nesting in the same field. Breeding activities begin early in April and continue until the arrival of the rains in June.

The nest is placed on the ground in a slight depression or old track, and at this hottest and driest season of the year is virtually unprotected from the sun. It seems incredible that the young are able to survive, exposed to a heat under which the ground has become dry and as hard as concrete and scorching hot. The birds are always extremely wild, slipping away from the nest at the first indication of danger; consequently, a nest can only be found by a careful and systematic search over the field. Several sites were kept under observation for some time, but the parent birds never could be flushed from the nests. One or two nests were placed beside traces of stubble, but the majority were fully exposed to the direct heat of the sun.

Two or three eggs constitute a complete set; these are gray, speckled and peppered with slate and yellowish brown, particularly about the larger end. Twelve specimens average 21.1 x 16.0 mm.

WHITE-BELLIED SWALLOW-SHRIKE, *Artamus leucorynchus leucorynchus* (*Git-git*).—The Swallow-shrike is a widely distributed species, fairly common in most localities. However, it displays a decided preference for old clearings or open grassland having a scattered growth of low trees with an abundance of dead limbs or standing stubs. It is one of the most interesting birds of the region in that it combines habits and characteristics peculiar to three different genera. Much of its time is spent in the air, just sailing around or in search of insects, which are taken on the wing. At such times its soaring flight and general contour are like those of a large swallow. Its noisy and pugnacious actions about the nest are traits similar to those of the American genus *Tyrannus*, and the creamy-colored eggs closely resemble those of many of the flycatchers. However, the markings on the eggs and the construction of the nest are essentially those of shrikes.

All nests observed were found in April, but it is probable that the nesting season extends from March until May. The nest may be at any height above the ground, but is usually less than forty feet, and is normally confined to the outer twigs of a partially dead branch. A few nests were found in the very tops of tall bamboos, but such sites seemed to be utilized only where no dead branches were available. After a nest is completed, one or both of the parent birds are constantly close at hand and if the nest is disturbed, they immediately set up a tremendous fuss and loud outcry, circling close overhead and diving repeatedly at the intruder.

A typical nest examined April 20, 1928, was sixteen feet from the ground in the topmost branch of a small tree standing on an open hillside. It was five inches in diameter and three inches high, and was composed of small stems and vine tendrils loosely woven together with stray ends projecting from the sides. The lining consisted only of small, dry stems.

The Swallow-shrike lays from two to four eggs, which show similarity to the eggs of both the shrikes and the flycatchers, and suggest a close relationship to the latter group. They are very attractive—deep creamy white in tone, blotched about the larger end with light brown and a small amount of lilac. Thirteen specimens have an average measurement of 22.8 x 17.4 mm.

PHILIPPINE BLACK-HEADED SHRIKE, *Lanius nasutus nasutus* (*Ca-bi-so-te*).—The Black-headed Shrike is a very common breeding species in the open country between Fort McKinley and Los Baños, where it was found abundantly throughout the year.

Only a few birds were observed in other localities. The favorite haunt of this shrike is some open field with scattered clumps of bushes, where from a conspicuous perch it can scan its surroundings and watch for its prey which consists mostly of small lizards and large insects. Every pair appears to have three or four favorite lookout perches, and on one of these the birds may be found day after day.

The nesting season extends from early in April until June; occupied nests were observed from March 26 until June 1. The nest is usually less than six feet from the ground in a thick bush or low tree standing alone. However, a few nests were found in bushes bordering open fields, and one in an isolated bunch of cogon grass—but these are exceptional cases.

The nest is unusually well built for a tropical species. It is composed of grass stems, bamboo leaves and bits of weeds, interwoven with strips of plant fiber, and lined with fine rootlets. When completed, the nest is normally about five inches in diameter and three or four inches in height. Three or four eggs constitute a full set, though six were observed in one instance. These are light bluish gray, spotted and clouded about the larger end with yellowish brown and a few shell stains of lilac. The average measurement of twenty specimens is 22.7 x 18.0 mm.

CHINESE STARLING, *Aetheopsar cristatellus* (*Martinez*).—The Chinese Starling or Crested Myna, as it is sometimes called, was introduced into the Philippines by the Spanish in about 1850. It seems to have thrived very well and is commonly observed about Manila and in the barrios bordering Laguna de Bay. It is less commonly seen elsewhere, however, though rather generally scattered throughout central Luzon. A single pair was observed at Baguio. These birds are usually seen in small flocks of from three to eight; they remain close to human habitations, never straying far from the farming districts, and might be considered a bird of the street and garden. None was ever observed in the woods or mountains. The birds are locally known as Mar-ti'-nez, and many of the rural Tagalogs claim that they have the ability of learning to speak.

This species breeds principally during April and May. The nest is located either in a tree-cavity or in some hole or crevice in the eaves of a building. In either event the recess is completely filled with grass, rubbish, rags or any other convenient material, and this is lined with grass and feathers. Three or four eggs are laid; these are light blue, rather glossy and without markings. The average size of a small series is 27.0 x 20.5 mm.

YELLOW-HEADED SUNBIRD, *Cyrtostomus fernatus jugularis* (*Pit-pit*).—The sunbirds and flowerpeckers are very small and possess many of the characteristics of the hummingbirds. The present species is not particularly rare, but the birds are so small and active that they are easily overlooked; thus little is known concerning their habits. These birds frequent areas that are dotted with low bushes or small trees, and especially those in which there is an abundance of flowering shrubs.

Two nests were collected: one containing a single egg, on February 26, 1928, and the other with two eggs, on June 1, 1929. Both were similarly located and were constructed very much alike. The first nest was about four feet from the ground, suspended from the outer twigs of a small bush, surrounded by dense brush. It was a purse-shaped affair with entrance near the top, and was composed of spider webs, leaf skeletons and bits of cocoons. These were all woven together with plant fibers, and the nest was lined with soft plant cotton. On the outside it was festooned and draped with bits of old grass and partially decayed leaves.

The three eggs are light grayish green, spotted with slate and olive brown. They average 15.8 x 11.5 mm. These eggs do not compare very well with the description

given by Grant and Whitehead in 'The Ibis' (vol. 4, 1898), but the identification of both nests was confirmed by collecting the female parent in each case.

MAYEN'S SILVEREYE, *Zosterops mayeni*.—The Mayen's Silvereye is a rather common but inconspicuous species about the open rice fields, and remains well concealed in the bamboo thickets around the border. The male is an excellent songster and, during the breeding season, frequently sings in the vicinity of the nest.

Two nests with three eggs each were collected, both in similar situations and of nearly identical construction. The first was found on April 5, 1928, when it contained only a single egg; it was about thirty feet from the ground in the outer tip of a horizontal acacia branch at the edge of a rice field. On April 12, when the nest contained three eggs, it was collected, together with the female bird. This nest was of the vireo type and was suspended from the fork of a small branchlet; it was three inches in diameter and two inches deep and was composed of plant fibers, spider webs, fine grasses and plant cotton, the whole lined with hair-like grass. The outside was decorated with a few small leaves, which had evidently been picked and tucked into the side of the nest while green.

The eggs of the Mayen's Silvereye are pale sky blue, without markings and the shell shows a slight amount of gloss. Six specimens have an average size of 15.0 x 12.1 mm.

MALAY TREE SPARROW, *Passer montanus malaccensis* (*Gor-re-on*).—According to McGregor, this is an introduced species in the Philippines, but it is not known whether this statement was based on fact or opinion. Tree Sparrows are rather abundant in the immediate vicinity of Manila and at Fort McKinley, but elsewhere in central Luzon they are rare. A few sparrows were observed in most of the larger towns, but never in the immense flocks that are common in and around Manila. Like its near relative, the English Sparrow (*Passer domesticus*), the Malay Tree Sparrow is a bird of the city streets and alleys, and is seldom found very far from human habitations, except during the period that rice is being harvested. At this season immense flocks appear, banding together with two of three species of weavers. These do considerable damage to the ripening rice, and are a source of much annoyance to the agriculturalist.

Nearly all of the nests observed were in the period between March and August, but it is quite possible that individual pairs may be found nesting in nearly every month. The nest is placed either in a crevice or nook in a building or in a low tree. If in a tree, the nest is rather a bulky affair and is roofed over, with an entrance on the side; if in a cavity, the available space is rather well filled. In either case, the nest is made up of a nondescript accumulation of any convenient material, but usually consists of rags, bits of paper, old grass or strings, and is lined with grass and feathers.

In central Luzon the Tree Sparrow lays from two to five eggs to a set, three being the most common number. The ground color is grayish white and, though there is considerable variation in the color and arrangement of markings, they are usually spotted, speckled and blotched with varying shades of ashy brown.

PHILIPPINE WEAVER, *Munia atricapilla jagori* (*Mi-ha*).—This species is commonly known as the Ricebird, and is abundant throughout central Luzon. It is normally seen in small flocks, but with the ripening of the rice crop flocks of several hundred invade the fields, causing considerable damage. Large numbers are shot or snared for food, but it is also a favorite cagebird, and can always be found for sale in the markets.

The breeding season is much prolonged and isolated pairs probably breed throughout most of the year, but the majority are found nesting between February and June.

They may nest in colonies or again, in widely separated pairs, but at least two or three nests are usually found close together. These are usually four or five feet from the ground, either in the tall cogon grass or in a low bush. If the choice is a bush, it is one growing beneath an overspreading tree or as undergrowth beneath heavier foliage. A rather unusual colony was observed near Arayat on May 5, 1929. Here the birds were nesting in low marsh grass, none of the nests being more than eight inches above the ground.

The nest is a loosely built, somewhat globular structure with an entrance on the side. It is composed of grass and grasstops, with usually a few bamboo leaves interwoven in the outer framework. The lining consists of fine grasses or grass-tops with the seeds still attached.

The Philippine Weaver usually lays four or five eggs to a set, but the number may vary from three to seven. They are dull white without gloss and vary greatly in both size and shape; even eggs of the same set show much variation. Twenty specimens have an average measurement of 15.6 x 11.3 mm.

CABANIS'S WEAVER, *Munia punctulata cabanisi*.—Cabanis's Weaver is similar in habits to its close relative, the Philippine Weaver, and both species are frequently found together. However, it is less gregarious than that form, for only two or three pairs are normally associated together. It is the most abundant breeding species in the vicinity of Manila, although *Munia a. jagori* is more numerous throughout the region as a whole and large numbers of both species are often observed in the markets, where they are sold both for food and as cage pets.

Cabanis's Weaver breeds throughout the year; occupied nests are found in every month, but the principal nesting period occurs from February until May. Two or three nests are sometimes found in the same tree or at least fairly close together, but there is never a large nesting colony, and a single nest is the normal occurrence. This is similar in appearance and construction to that of the Philippine Weaver, but its situation is very different. Cabanis's Weaver always places its nest in the outer twigs of a branch, well toward the top or outside of a tree and at almost any height above the ground. The Philippine Weaver, on the other hand, nests in grass or brush more normally, and if in a tree at all, the nest is found well toward the center and well covered by taller foliage. After young have been reared in a nest, it is frequently cleaned out, relined and used for a second brood, provided it has not in the meantime been preempted by lizards or ants.

The eggs of Cabanis's Weaver are dull white, without gloss or markings, and cannot with certainty be distinguished from those of the Philippine Weaver, though they average smaller and are slightly more pointed. Full sets may range from three to seven eggs, but the usual number is four or five. Twenty specimens have an average measurement of 14.8 x 10.2 mm.

EVERETT'S WEAVER, *Urolonchа everetti*.—Everett's Weaver, though not nearly as common, has much the same habits as Cabanis's Weaver and like it, was most often seen in pairs or small flocks which favored the open trees bordering woods instead of the grass fields.

The breeding season is doubtless as prolonged as that of the other weavers and the nest in its situation and construction cannot be distinguished with certainty from that of Cabanis's Weaver. Several nests with young were observed during the months of March and April and a set of five eggs was taken in Pampanga Province, May 25, 1928. This nest was the usual globular affair, about seven inches in diameter with an entrance on the side. It was composed of narrow blades of grass, grass-tops and bamboo leaves all well laced together and lined with fine grass-seed stems.

The eggs are pure white, rather round and without markings. They are similar to the eggs of the other weavers but the shell texture is more close-grained and they appear slightly glossy. The five eggs have an average size of 15.1 x 11.8 mm.

2620 Grays Ferry Ave.
Philadelphia, Pennsylvania

THE SCLEROTIC RING IN NORTH AMERICAN BIRDS

BY ELIZABETH L. CURTIS AND ROBERT C. MILLER

Plate 9

IT is well known to students of ornithology that a number of birds, particularly such larger forms as eagles, hawks, vultures and owls, have in the sclerotic coat of the eye a supporting ring of bony plates. Less well known is the fact that such a ring is developed to a greater or less degree in the eyes of all species of birds. Even in hummingbirds sclerotic rings are found, made up of minute osseous plates of almost the thinness of tissue paper. Comparatively little attention has been devoted to these rings, although according to Lemmrich (1931), who gives a history and rather complete bibliography of the subject, knowledge of their occurrence in birds of prey dates back to the thirteenth century, and a clear description of them was given by Volcher Coiter in 1645. Students of the osteology of birds, however, have as a rule merely referred to the sclerotic ring in passing, sometimes taking casual notice of the number of plates but giving no consideration to details of shape or arrangement.

Slonaker (1918, 1921) has given a careful description of the structure and embryonic development of the scleral plates in the eye of the English Sparrow. Heilmann (1927) has mentioned and figured the scleral ring in certain recent and fossil birds and reptiles. It remained for Lemmrich (loc. cit.) to point out, after examination of representatives of a considerable number of orders and families of birds, that a great deal of variation in the character of the sclerotic ring occurs in different groups, but that a degree of constancy usually prevails within given families or orders.

The present study was largely completed before Lemmrich's investigations came to our attention. The findings here reported, however, are in the nature of an extension rather than a duplication of that author's work, inasmuch as he dealt largely with European birds, and in cases where American species were considered his material was rather limited. In the present investigation 1404 pairs of sclerotic rings have been examined in considerable detail, including those of 235 species involving representatives of all of the orders of North American birds except one (no specimens of trogons having come to hand). In general we have several species represented in each order and in a few cases (English Sparrow, Mallard and Glaucous-winged Gull) enough individuals of one species have been available to permit a statistical study.

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Helpful suggestions have been given by Professor Joseph Grinnell, Professor Alden H. Miller and Dr. Jean M. Linsdale of the Museum of Vertebrate Zoology, University of California, Berkeley. Professor J. L. Slonaker of Stanford University has very generously cooperated in making available his own admirable preparations of sections through the eyes of birds of several species.

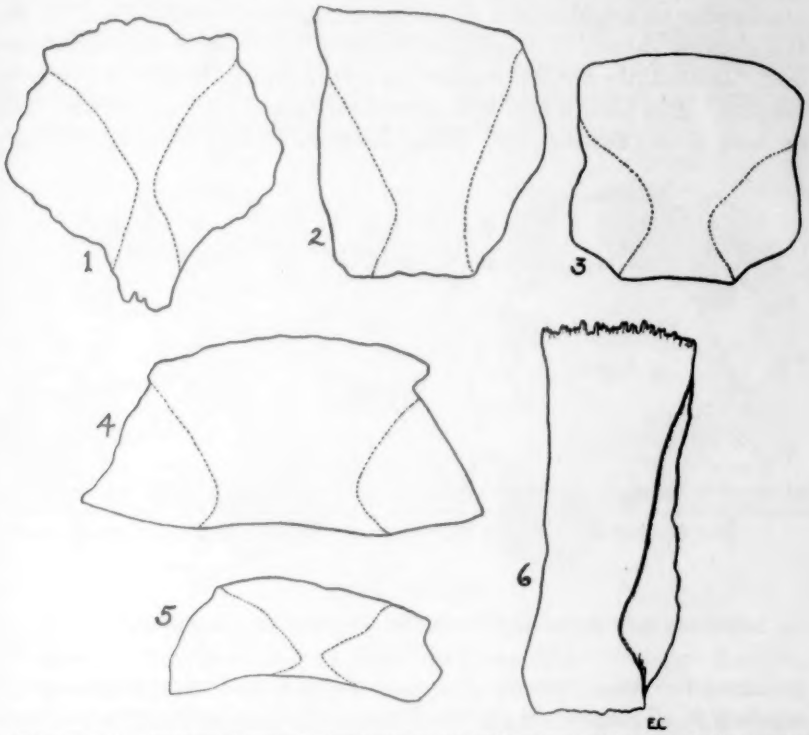
DESCRIPTION OF THE SCLEROTIC RING

The sclerotic ring of the avian eye is composed of a number of individual plates, placed side by side and overlapped to form a bony ring which surrounds the pupil of the eye and extends inward to a distance that is exceedingly variable in different orders of birds. The ring represents an ossification of a portion of the sclerotic coat and doubtless serves primarily for the protection of the eye-ball and for its support during contraction of the ciliary muscles (Slonaker, 1918, 1920). When removed from the eye, the ring has more or less the shape of a truncated cone, sometimes symmetrical, but in most cases having the aperture more or less eccentric, usually toward the nasal margin of the eye. The steepness of the ring is extremely variable. In some groups, as the herons, it is nearly flat; in others, as in the owls, it is so steep as to approximate Lemmrich's (1931) characterization of "tubular" (see Plate 9). There is, of course, much variation in the size of the rings. The largest ring we have examined, that of the Great Horned Owl, measures 36 mm. at its greatest diameter; the next in size, that of the Golden Eagle, 33 mm. The smallest, that of the Rufous Hummingbird, measures 4.5 mm.; next in order of size come the Green-backed Goldfinch, 4.6 mm., and the Coast Bush-tit, 5.5 mm.

The shape of the individual plates varies greatly (Text-fig. A). They are joined to one another in such a way that there is more or less overlapping of the border of one plate upon the next. This overlap is commonly more pronounced at the inner border of the ring, so that the plates are widest at the end proximal to the pupil. Occasionally the maximum overlap occurs near the middle of the plates, as in the auklet and the puffin. In the kingfishers and the woodpeckers overlapping occurs at the inner ends of the

plates only. In owls, vultures and falcons the plates are joined with only a very small lap. Audubon's Caracara shows the least amount of overlapping of any species examined. The majority of orders show a large degree of overlapping.

The individual plates vary considerably in thickness. Slonaker (1918) says of the scleral plates of the English Sparrow: "Their thickness is greatest



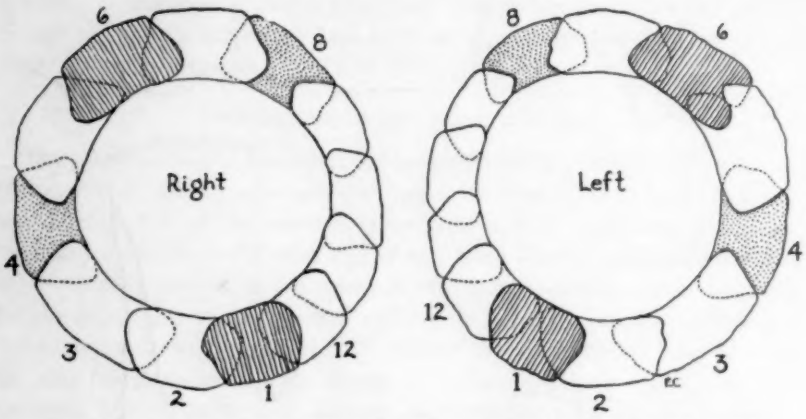
TEXT-FIG. A.—Various shapes of scleral plates: (1) Rhinoceros Auklet; (2) Golden Eagle; (3) Western Belted Kingfisher; (4) Northwest Coast Heron; (5) Domestic Pigeon; (6) Dusky Horned Owl. All drawings made with camera lucida. × 3.5.

in the middle portion and tapers off to a thin edge on their lateral sides. . . The combined thickness of the overlapping portion about equals the thickest portion of the plate. A ring of bone of practically uniform thickness is thus formed, completely surrounding the eye." This is true of all the rings we have examined. The thickest plate we have seen is that of the Great Horned Owl which measures 1.8 mm. in the heaviest part, while that of the Golden Eagle measures 1 mm. At the other extreme are the hummingbirds and the smaller passerine birds such as warblers, kinglets and bush-tits, with plates exceedingly thin and fragile. The density of the

plates increases with the age of the birds, but even in adults of the types mentioned the plates are extremely thin and flexible. On the other hand, the diving birds show a rather heavy bony structure even in immature specimens.

RING PATTERN

Any number of plates may be arranged to form a circle, with each plate overlapping its neighbor in a clockwise or counter-clockwise direction, but this simplest pattern of overlapping we have not found in any ring examined. Instead, the regular overlapping is interrupted by what we term an *overplate*. This plate is similar in shape to its neighbors, but overlaps them on both sides (Text-fig. B). Using the clock face to show approximate



TEXT-FIG. B.—Scleral rings of the Rufous Hummingbird. Camera lucida, × 12.

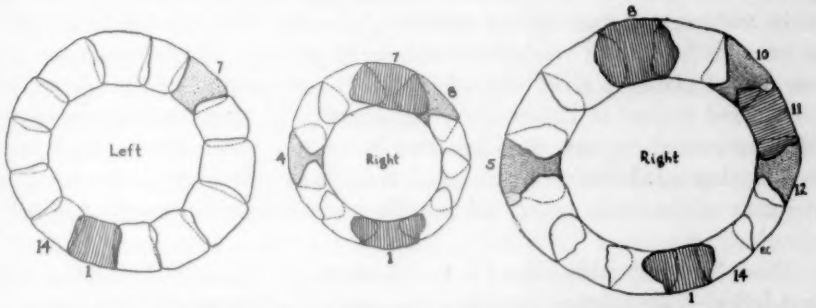
position of certain plates in the ring, we find that an overplate occurs regularly in all rings in the position five to six o'clock in the right, and six to seven o'clock in the left eye. We call this overplate no. 1 and in counting always begin at this point.

Each *overplate* requires a corresponding *underplate* (Text-fig. C), as may easily be demonstrated by arranging playing cards in a circle. One overplate and one underplate occur regularly in the eye-rings of hawks and owls and usually in wrens. Lemmrich finds this true of the European Skylark also. In most species of birds there are two overplates and two underplates. The overplates lie in the position of five to six o'clock and eleven to twelve o'clock in the right, and six to seven and twelve to one in the left ring; the underplates occur at eight to nine, and one to two o'clock in the right ring.

Three overplates and underplates occur regularly in loons, and in six per cent of the ducks (see Table 1 for other examples). These three over-

plates occur at five to six, eleven to twelve, and two to three o'clock in the right ring, and in the reversed positions in the left. The three underplates occur at eight to nine, one to two and three to four o'clock in the right ring. In a very few cases (five single rings out of more than 1400 pairs) four overplates and underplates have been found. This condition has occurred in one eye only of a Lesser Loon, a Brown Pelican, a Bufflehead, and two Domestic Geese.

In recording the ring-pattern we have used Lemmrich's method in order to facilitate comparison with his findings. Beginning with the overplate which occurs in a ventral position, we count clockwise in the right, and counter-clockwise in the left ring (see Text-fig. B).



TEXT-FIG. C.—Scleral rings drawn to illustrate one, two and three overplates and underplates respectively (overplates ruled and underplates stippled). Left to right: Western Pigeon Hawk, Western White-winged Dove, Pacific Loon. Camera lucida, × 2.3.

INTERLOCKING

Occasionally interlocking plates are found, in which the border of one partially overlaps and partially underlaps its neighbor (Text-figs. B and C). In such cases, the overlap at the inner or pupillary border has been arbitrarily considered to establish the status of the plate as an overplate or an underplate. As Lemmrich points out, interlocking tends to occur in a definite location in the ring. Thus we have found that in loons and herons, interlocking occurs most frequently between plates 4 and 5. In hawks the modal position for interlocking is between plates 6 and 7, for turkeys 8 and 9, chickens 9 and 10, gulls 7 and 8, horned owls 1 and 2, and flickers 5 and 6. Interlocking may, however, occur between any two plates, though it is found most frequently between an overplate or underplate and its neighbor in the ring. It may also occur several times in one eye.

Of the birds included in this study 41 per cent show interlocking plates in one or both eyes. In 22.4 per cent both eyes are involved, and in 7.5 per cent the interlocking is symmetrical in right and left eyes. Some orders show little or no interlocking. A single case has been discovered among

the Columbiformes, and the condition has been found in only 12 per cent of Micropodiformes. Anseriformes are low with 21.1 per cent, and Passeriformes high with 56.8 per cent; the woodpeckers are highest with 81.5 per cent showing interlocking between two or more plates.

RING-PATTERN VARIATION IN RIGHT AND LEFT EYES

A question which presents itself for discussion is that of the constancy in number and arrangement of the plates in the sclerotic ring, first as regards the two eyes of the same individual, then as regards species and larger groups. In a large majority of cases the two eyes of individual birds are symmetrical as to number and arrangement of plates. Lemmrich reported 43 variants out of 148 pairs of rings, or 29 per cent variation between right and left eyes, considering number of plates alone. Of 1404 birds considered in the present study, only 326, or 16 per cent, showed variation in number of plates in right and left eyes. If arrangement of the plates be considered instead of the number, there is slightly more variation: 258 or 18.3 per cent show variation in pattern in the two eyes. If both the number of plates and the ring-pattern be considered, 334 individuals, or 23.7 per cent of the whole group, exhibit differences between the right and left eyes.

There is considerable difference in the amount of variation between right and left eyes in different groups. The orders Gruiformes, Columbiformes, and Micropodiformes show remarkable constancy in this respect, although our number of specimens in these groups is too small for statistical analysis. Anseriformes are fairly constant (see Table 2). while Piciformes and Strigiformes show the greatest amount of variation, 42.1 per cent and 38.7 per cent, respectively.

In Table 2a are shown the data for variation between right and left eyes in four species, selected by reason of the large numbers of individuals available.

DISCUSSION

The number of plates occurring in the sclerotic ring in birds considered as a class has been variously stated as from twelve to twenty (Coues, 1884), ten to seventeen (Heilmann, 1927), eleven to seventeen (Lemmrich, 1931). In the present study the range has been found to be from eleven to eighteen. The former number is characteristic of one entire order (Columbiformes), while the latter number was found in two individual birds (one Common Tern, one Baldpate) out of the 1404 examined. The modal numbers of different orders ranged from eleven to fifteen, with fourteen or fifteen the most common. No relation was found between the number of plates and the size of the ring. For example, the loons, herons, ravens, and bush-tits all characteristically have fourteen plates.

In so far as there is any overlapping of species considered by Lemmrich and by us, there is a fair measure of agreement in the findings. Seventeen of the 235 species (disregarding subspecific differences) considered in the present study have been reported on by Lemmrich; in the case of eleven of these we are in complete agreement. In the case of *Rissa tridactyla* we agree with Lemmrich as to number of plates in the ring, but he gives no pattern. As regards *Spatula clypeata* we disagree with Lemmrich as to the number of plates, and in *Mergus merganser* we disagree as to pattern. In *Aquila chrysaëtos*, *Nyctea nyctea*, and *Asio flammea* we disagree on both number and pattern.

Besides the foregoing cases of identical species, we find twenty-one additional genera on which Lemmrich and we have worked in common. Here we find about the same order of agreement, sixteen cases in which we are in complete agreement, and five in which we disagree. In most of these cases of disagreement, one specimen only (in some cases one ring only) was available either to Lemmrich or to us.

In the following pages, wherever it becomes necessary to take issue with conclusions set forth by Lemmrich, it should be understood that no criticism is intended of the carefulness of that author's work; but only that a larger amount of material leads to a different conclusion. Lemmrich draws the generalizations that (1) primitive groups of birds have a smaller number of plates in the ring; (2) that domestication (as in the Domestic Fowl) causes an increase in variability; (3) that higher groups have greater constancy in the number of plates. The first of these conclusions finds no support from our data (see Table 1). Thus the lowest order, Gaviiformes, has fourteen plates, the same number as Passeriformes, while the smallest modal number of plates is found in Columbiformes, a group rather well up in the scale.

With regard to the conclusion that domestication increases variability, our data (Table 3) lend little support to Lemmrich's view. In comparing domestic races with their nearest relatives in the wild, we find in the case of Anatidae and Phasianidae that the wild forms show a greater variation in number of plates, while the domesticated forms show the higher degree of variation in *pattern*. It is to be noted also (Table 2a) in this connection that the white Leghorn Fowl shows a high percentage of variation between right and left eyes. The Domestic Turkey (Table 3) is remarkably constant in both number and pattern. It might be argued that the turkey has been so recently domesticated that it is still very close to its wild progenitor, or progenitors, and that the Domestic Turkey probably represents a blend of two or more distinct species. The Domestic Pigeon, however, shows very nearly the same degree of constancy, although it has been bred under domestication possibly as long as the Domestic Fowl. In Table 4 is shown

the variation in number and pattern in sixteen species selected at random from ten different orders of birds, and in Table 4a is shown the variation among seven species of a single family. The amount of variation among wild birds shown in these tables is greater than that of any domesticated races of birds we have investigated.

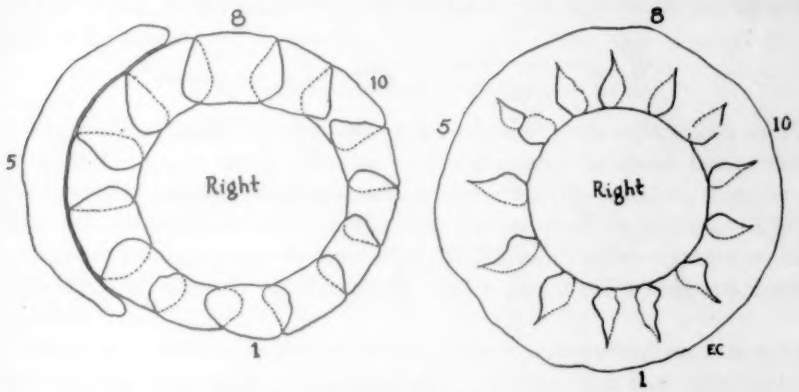
These tables also cast doubt upon Lemmrich's suggestion that higher orders of birds exhibit greater constancy in the number of plates in the ring. This statement would be true if one considered only the modal number of plates in different families within an order, which is possibly what Lemmrich had in mind. In Passeriformes, for example (see Table 1), we find every family exhibiting a modal number of fourteen. However, when we consider *individual* variation within a species, this appears to be as great in higher as in lower forms.

FUNCTION OF THE RING

The function of the sclerotic ring constitutes something of a problem. It might be suggested that inasmuch as a similar ring is found in the eyes of many reptiles, the structure is merely one that has been carried over from the latter group. This suggestion, however, only pushes the explanation one step farther away. The universal presence and very considerable development of the sclerotic ring in birds suggests, moreover, that it is not simply a vestigial structure carried over from a more primitive group; to attain the degree of development it does, it must have some function in the bird today. To a certain extent the sclerotic ring may be regarded as a protection for the eyeball, although it would appear that, in general, injuries to the eye would occur in the pupillary area rather than through the sclerotic coat. Slonaker (1918, 1920) has suggested that the primary function of the ring is in connection with the mechanism of accommodation. It is his view that contraction of the ciliary muscles effects an increase in intraocular pressure, thus pushing the lens farther out to accommodate for near vision. He considers that some bending of the plates is involved in this process. It is not impossible that a certain amount of bending occurs in the scleral plates of the English Sparrow, as studied by Slonaker, and in some other cases where the ring is wide and flexible. Too much emphasis should not be placed, however, on the bending of the plates, or their possible sliding upon one another as a factor in accommodation. Interlocking of plates (Table 2) which has been mentioned above, would interfere with any such motion; and in certain cases there is a type of structure which would tend to prevent any motion. For example, in the eyes of the woodpeckers (Text-fig. D) the plates are firmly fused at the outer margin; and in some of the jays (Text-fig. D) there is an accessory bony plate developed along the temporal margin of the ring which would hold the plates rigid

for at least a third of the circumference of the eye. In diving birds (vide infra) the ring is obviously too heavy and rigid to be warped by the pull of the ciliary muscles. The contraction of these muscles alone would appear adequate to effect the small increase in intra-ocular pressure necessary to move the lens, without requiring any bending of the plates or their sliding upon one another. It should be pointed out that the attachment of the muscles of accommodation is to the fascia and the scleral cartilage within the ring, not to the bony ring itself.

With regard to the reason for the persistence of individual plates in the ring, the best view seems to be that this is essential to growth in size of the ring from early to adult life. Lemmrich (1931) has pointed out that growth

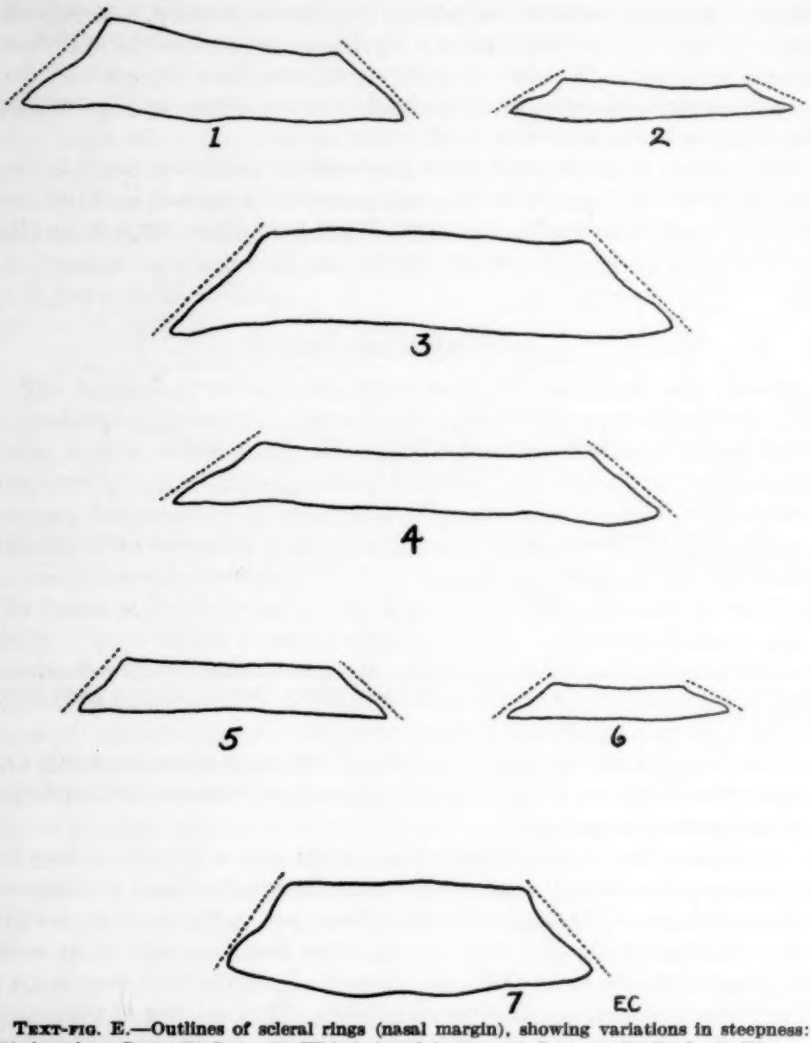


TEXT-FIG. D.—Left: scleral ring of California Jay, showing accessory bony plate at temporal margin. Right: scleral ring of Northwestern Flicker, showing fusion of plates along outer margin. Camera lucida, × 3.5.

of the rings occurs by increase in size of the individual plates in exactly the same way that growth of the skull occurs through enlargement of the individual bones at their margins.

Concerning the matter of protection and support of the eye, it may be pointed out that diving birds have the sclerotic ring developed to an extraordinary degree. The ring in murres, loons and puffins is more heavily bony in proportion to size than in any other forms studied. It is to be noted also that the slope of the ring is steeper in diving birds than in their immediate relatives that have not this habit. Thus the ring of the coot is steeper than that of the rail, the ring of a scoter steeper than that of a mallard, and the ring of the dipper notably steeper than that of the wren (see Text-fig. E). Rapid fliers, such as swifts and swallows, also have steep-sided rings, although it cannot be observed that the ring is particularly heavy. It would appear that the steeper-sided ring gives greater support to the outer part of the eyeball, which would be advantageous

alike to diving birds, whose eyes are subjected to pressure from the water, and to swift-flying birds whose eyes are subjected to the pressure of rushing air.



TEXT-FIG. E.—Outlines of scleral rings (nasal margin), showing variations in steepness: (1) American Coot; (2) Sora; (3) White-winged Scoter; (4) Common Mallard; (5) Dipper; (6) Tule Wren; (7) Black Swift. Camera lucida, × 5.

ECCENTRICITY OF THE RING AND BINOCULAR VISION

Monocular vision is generally regarded as characteristic of birds, although Chievits (1891, 1899), Slonaker (1897, 1918), and Wood (1917) have pointed

out that there is often a well-developed temporal fovea which permits more or less acute vision of objects directly in front of the bird. The present writers have given no attention to the problem of binocular vision, except casually to consider its possible relation to eccentricity of the aperture of the sclerotic ring. When the aperture is off center, it is usually displaced toward the nasal margin (Text-fig. D). While a majority of birds exhibit a certain degree of eccentricity of the aperture, the condition is most marked in pelicans, turkeys, herons, coots, pigeons and doves, owls, swifts, and jays. Of these, at least, the pelicans, herons, and owls may be presumed, from the position of the eyes, habitually to bring them both to bear on the same object. Eccentricity of the aperture may thus be regarded, at least in certain cases, as an adaptation to facilitate convergence of the eyes in binocular vision.

TAXONOMIC VALUE OF THE SCLEROTIC RING

The present study was motivated primarily by the thought that a careful comparative study of the sclerotic ring in different orders of birds might yield data of definite taxonomic value. The results, however, considered from that standpoint, have frankly been somewhat disappointing. There is usually close agreement in the number of plates in different genera within a family, but different families in one order may have a different modal number.

Rings as distinctive as those of hawks, owls or woodpeckers may be recognized by anyone; and a person thoroughly familiar with large numbers of sclerotic rings can generally group them on sight, even in many cases assigning an unlabelled ring to its proper genus. But the differences upon which such recognition is based, including such variables as size, shape, curvature, slope, color, texture, regularity or eccentricity, degree of overlapping, are difficult to describe and impossible to tabulate. The attempt to organize the data concerning such relatively simple matters as number and arrangement of the plates (Table 1) leads to a rather complicated tabulation. It does not appear practicable at present to attempt to systematize the more subtle differences.

In certain specific cases, the structure of the sclerotic ring may be of assistance in determining relationships between species, or larger groups. One or two illustrations may be cited. In the first jays examined it was noted as a matter of some interest that an additional bony plate is attached to the temporal margin of the ring, extending about one-third of its circumference (Text-fig. D). This was not found in the Crow. Further investigation showed that the condition does not exist in any of the members of the subfamily Corvinae that we have examined (*Corvus*, *Cyanocephalus*, *Nucifraga*) but is uniformly present in the genera *Cyanocitta* and *Aphelocoma* of

the subfamily Garrulinae. Of fourteen magpies examined, four showed a rudiment of such a plate in one or both eyes. The genus *Perisoreus* shows no trace of such a structure. One may conclude that, so far as eye-rings may be used as a guide, the subfamilies Garrulinae and Corvinae are natural groups, with *Cyanocitta* and *Aphelocoma* more closely related to each other than to *Pica*. The status of *Perisoreus* is left undetermined on this basis.

In Micropodiformes, it is to be noted that the number of plates in the scleral ring, fifteen in swifts and twelve in hummingbirds, affords additional justification for the division of this group into the two suborders Micropodii and Trochili.

It is strongly to be urged that persons collecting birds give attention to the sclerotic ring and carefully preserve it, either with the skeleton, or with the skin if a skeleton is not made.

TABLE 1

A Systematic Survey of the Structure of the Sclerotic Ring

Order, Suborder and Family	No. of species examined	No. of pairs of eye-rings examined	Modal no. of plates	Range of no. of plates	Segregation according to number of over- and underplates[1]				Typical position of over- and underplates (ring pattern)	
					1	2	3	4	O	U
GAVIIFORMES										
Gaviidae	3	10	14	14–15			9.5	.5	1–8–11	5–10–12
COLYMBIFORMES										
Colymbidae	3	8	15	11–15	3.5	4.5			Not determined	
PROCELLARIIFORMES										
Procellariidae	3	7	15	14–15		7			Not determined	
Hydrobatidae	2	2	13			2			Not determined	
PELECANIFORMES										
Pelecani										
Pelecanidae	1	1	14				0.5	0.5	Not determined	
Phalacrocoracidae	3	8	13	12–14		8			Not determined	
Fregatae										
Fregatidae	1	1	15		1				1	6
CICONIIFORMES										
Ardeidae	2	8	14	14–15		8			1–8	5–10
ANSERIFORMES										
Anatidae	26	331	15	13–18		310.5	19	1.5	1–9	5–11
FALCONIFORMES										
Cathartae										
Cathartidae	2	3	15	13–15	1.5	1.5			Not determined	
Falcones										
Accipitridae	13	48	15	14–17	43	5			1	6
Falconidae	5	21	14	14–16	17.5	3.5			1	7

[1] In this column are listed the number of pairs of rings having one overplate, two overplates, etc.; e. g., in the Gaviidae, of ten pairs examined all had three over- and three underplates, except one, in which one eye exhibited three and the other eye four.

TABLE 1 (cont.)

A Systematic Survey of the Structure of the Sclerotic Ring

Order, Suborder and Family	No. of species examined	No. of pairs of eye-rings examined	Modal no. of plates	Range of no. of plates	Segregation according to number of over- and underplates[1]				Typical position of over- and under-plates (ring pattern)	
					1	2	3	4	O	U
GALLIFORMES										
Galli										
Tetraonidae	6	10	14			10			1–9	6–10
Perdicidae	2	19	14	13–15		17	2		1–9	6–10
Phasianidae	2	92	14	13–16	17.5	74	0.5		1–9	6–10[2]
									1–9	7–10[3]
Numididae	1	3	14	13–14		3			1–9	6–10
Meleagrididae	1	34	14			34			1–9	6–10
GRUIFORMES										
Rallidae	3	26	13	12–14		26			1–8	6–9
CHARADRIIFORMES										
Charadrii										
Charadriidae	3	9	15	15–16		9			1–9	5–11
Scolopacidae	5	16	15	12–16		15.5	0.5		1–9	5–11
Recurvirostridae	1	1		15–16		1			Not determined	
Phalaropodidae	2	2	13			2			1–8	5–10
Lari										
Stercorariidae	3	13	15	14–16		12.5	0.5		1–9	6–11
Laridae	8	91	15	13–18		89.5	1.5		1–9	5–11
Alcae										
Alcidae	7	34	13	13–15		32	2		1–8	5–10
COLUMBIFORMES										
Columbidae	4	17	11	11–12		11			1–7	4–8
PSITTACIFORMES										
Psittacidae										
Australian Paroquet	1	18	12			17.5	0.5		1–7	4–9

[1] White Leghorn Chicken.

[2] Ring-necked Pheasant.

TABLE 1 (cont.)

A Systematic Survey of the Structure of the Sclerotic Ring

Order, Suborder and Family	No. of species examined	No. of pairs of eye-rings examined	Modal no. of plates	Range of no. of plates	Segregation according to number of over- and underplates[1]				Typical position of over- and underplates (ring pattern)	
					1	2	3	4	O	U
CUCULIFORMES										
Cuculidae	2	2	12			2			1–8	5–10
STRIGIFORMES										
Strigidae	7	31	15	14–17	30	1			1	6
CAPRIMULGIFORMES										
Caprimulgidae	2	4	15	15–16		3.5	0.5		1–9	5–11
MICROPODIFORMES										
Micropodii										
Micropodidae	3	22	15	14–16		17			1–9 1–8	6–11[4] 6–11[5]
Trochili										
Trochilidae	1	3	12			3			1–6	4–8
CORACIIFORMES										
Alcedinidae	1	2	13			2			1–8	5–10
PICIFORMES										
Picidae	8	38	13	13–15		37.5	0.5		1–8	5–10
PASSERIFORMES										
Tyranni										
Tyrannidae	8	16	14	14–16		16			1–8	5–10
Passeres										
Alaudidae	1	11	14	13–15	1.5	9.5			1–8	5–9
Hirundinidae	6	19	14	13–15	1	18			1–8	5–10
Corvidae	9	60	14	13–15		59.5	0.5		1–8	5–10
Paridae	3	13	14	14–15		13			1–8	6–10

[4] Vaux's and White-throated Swift.
[5] Black Swift.

TABLE 1 (cont.)

A Systematic Survey of the Structure of the Sclerotic Ring

Order, Suborder and Family	No. of species examined	No. of pairs of eye-rings examined	Modal no. of plates	Range of no. of plates	Segregation according to number of over- and underplates[1]				Typical position of over- and underplates (ring pattern	
					1	2	3	4	O	U
PASSERIFORMES										
Passeres (*cont.*)										
Sittidae	1	3	14			3			Not determined	
Certhiidae	1	2	14			2			Not determined	
Cinclidae	1	4	14	13–15		4			Not determined	
Troglodytidae	5	13	14	14–15	11	2			1	7
Mimidae	3	6	14			6			1–8	6–10
Turdidae	7	59	14	13–15		58.5	0.5		1–8	5–10
Sylviidae	2	5	14	14–16		5			1–8	5–10
Motacillidae	1	1	14			1			1–8	6–9
Bombycillidae	1	9	14	14–15		9			1–8	5–10
Ptilogonatidae	1	1	14			1			1–8	5–10
Laniidae	1	12	14	14–16	0.5	11.5			1–8	5–10
Sturnidae	1	1	14			1			1–8	7–10
Vireonidae	3	7	14			7			Not determined	
Compsothlypidae	10	22	14	13–15		22			1–8	5–10
Ploceidae	1	73	14	13–15	1	72			1–8	6–9
Icteridae	4	17	14	13–15		17			1–8	5–10
Thraupidae	1	4	14			4			1–8	6–10
Fringillidae	28	113	14	13–15	2.5	110	0.5	1	1–8	6–10

TABLE 2

Summary of Variation between Right and Left Eyes

Order	No. of pairs of eye-rings examined	Variation in no.	% of variation in no.	Variation in pattern	% of variation in pattern	Variation in no. or pattern or both	% of variation in no. or pattern or both
Gaviiformes	10	1	10	2	20	3	30
Colymbiformes	8	1	12.5	3	37.5	3	37.5
Procellariiformes	9	1	11.1	4	44.4	4	44.4
Pelecaniformes	10	0	0	4	40	4	40
Ciconiiformes	8	1	12.5	3	37.5	3	37.5
Anseriformes	331	44	13.2	54	16.3	71	21.4
Falconiformes	72	45	61.6	18	25	22	30.5
Galliformes	158	23	14.5	35	22.1	45	28.4
Gruiformes	26	4	15.7	3	11.5	4	15.7
Charadriiformes	166	30	18	27	16.3	35	21
Columbiformes	17	1	5.8	0	0	1	5.8
Psittaciformes	18	0	0	4	22.2	4	22.2
Cuculiformes	2	0	0	0	0	0	0
Strigiformes	31	10	32.1	6	19.3	12	38.7
Caprimulgiformes	4	1	25	1	25	1	25
Micropodiformes	25	3	12	1	4	3	16
Coraciiformes	2	0	0	0	0	0	0
Piciformes	38	3	7.9	15	42.1	15	42.1
Passeriformes	470	58	12.3	97	20.6	107	22.7
Total	1404	226	16	258	18.3	334	23.7

TABLE 2a

Variations between Right and Left Eyes in Selected Species

Mallard	111	11	10	9	8	17	15.5
White Leghorn Chicken	54	10	11.4	20	37	24	44.5
Glaucous-winged Gull	60	12	20	13	21.6	14	23.3
English Sparrow	65	16	25.4	18	28.5	21	33.3

TABLE 3

Comparison of Wild with Domestic Species

	No. of pairs of rings examined	No. of patterns occurring	Prevailing pattern	% of variation from prevailing pattern	Modal no. of plates	Range of no. of plates	% of variation from modal no. of plates
Domestic Duck	32	8	1-9 5-11	18.7	15	14-16	4.6
Mallard	111	8	1-9 5-11	10	15	14-17	10
Domestic Goose	19	12	1-9 5-11	47.3	15	14-16	15.7
Wild Goose	7	4	1-9 5-11	35.7	15	12-15	29 5
White Leghorn Chicken	59	7	1-9 6-10	53.3	14	13-16	14.4
Ring-necked Pheasant	25	9	1-9 7-10	30	14	13-15	12
Domestic Turkey	34	2	1-9 6-10	1.4	14	13-14	1.4
Domestic Pigeon	11	1	1-7 4-8	0	11	11-12	4.4
Wild Pigeon	6	1	1-7 4-8	0	11		0

TABLE 4

Constancy of Pattern and Number of Plates

	No. of pairs of rings examined	No. of patterns occurring	Type pattern	No. of rings showing type pattern	% of variation from type pattern	Modal no. of plates in ring	Range of no. of plates in ring	% of variation from modal no.
Lesser Loon	7	4	1, 8, 11, 5, 10, 12	5	28	14	14–15	7.1
Northwest Coast Heron	5	4	1, 8, 5, 10	3.5	30	14	14–15	24
Mallard	111	8	1, 9, 5, 11	99	10.8	15	14–17	10
Cooper's Hawk	9	3	1, 7	6.5	27	15	15–16	13.3
Ring-necked Pheasant	25	9	1, 9, 7, 10	13.5	30	14	13–15	16.6
California Quail	16	3	1, 9, 6, 10	11.5	29	14	13–15	21.8
Wilson's Snipe	5.5	7	1, 8, 5, 10	2	63.6	13	13–16	36.3
Glaucous-winged Gull	60	13	1, 9, 5, 11	48.5	19.2	15	13–17	17.4
California Murre	19	5	1, 8, 5, 10	14	26.3	13	13–14	18.4
Australian Paroquet	18	8	1, 7, 4, 9	8	55.5	12		0
Horned Owl	12	3	1, 6	8	33.3	15	15–16	12.5
Black Swift	12	1	1, 8, 6, 11	12	0	15	14–16	8.3
Flicker	21	8	1, 8, 5, 10	10	52.3	13	13–14	14.2
Steller's Jay	14	3	1, 8, 5, 10	12.5	10.7	14	13–14	3.5
Robin	27	8	1, 8, 5, 10	21	22.2	14	13–16	11.1
English Sparrow	65	9	1, 8, 6, 9	46.5	28.4	14	13–15	20.7

TABLE 4a

Constancy of Pattern and Number in Highest Group

FRINGILLIDAE								
Rusty Song Sparrow	17	6	1, 9, 7, 10	10	41.1	14	13–15	8.8
Fox Sparrow	12	5	1, 8, 6, 10	7.5	37.5	14	13–15	12.5
White-crowned Sparrow	11	3	1, 8, 6, 10	10	9	14	13–15	13.6
Golden-crowned Sparrow	5	2	1, 8, 6, 10	4	20	14	14–15	20
Pine Siskin	5	3	1, 8, 6, 10	3	40	14		0
Junco	10	3	1, 8, 6, 10	6.5	35	14	14–15	5
Towhee	7	4	1, 8, 6, 10	5	28.5	14	13–14	28.5

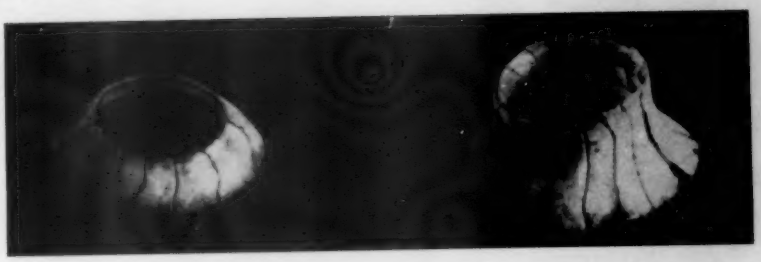
SUMMARY

1. A universal characteristic of the avian eye is the presence in the sclerotic coat of a number of small osseous plates, more or less overlapping to form a rather firm bony ring.

2. In the present study 1404 pairs of eyes have been examined, including those of 235 species belonging to nineteen orders. The study includes all orders of North American birds except Trogoniformes, of which no specimens have been obtained, and Psittaciformes of which the only representative studied was the Australian Paroquet.

3. The ring pattern, as determined by number and position of overplates and underplates, is generally constant within a family.

4. The number of plates in the ring ranges from a minimum of eleven, which is characteristic of the entire order Columbiformes, to a maximum of eighteen, found in only two individuals (one Common Tern, one Baldpate)



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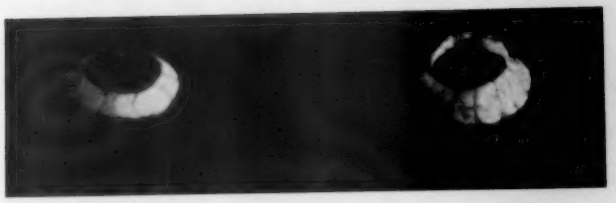

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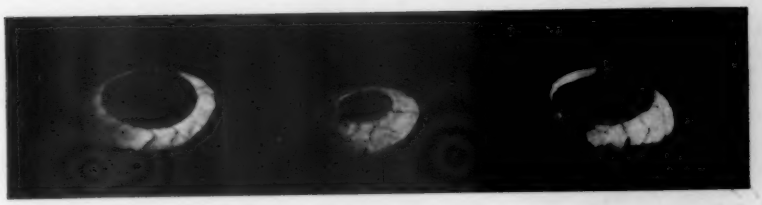

7 8 9

SCLEROTIC RINGS

of all the specimens examined. The modal numbers of different orders ranged from eleven to fifteen, with fourteen or fifteen the most common.

5. No relation has been found between size of the ring and number of plates, nor with systematic position and number of plates.

6. The evidence does not indicate that domestication causes any unusual degree of variation in the number of plates, or in the ring pattern.

7. There is usually a close agreement in the number of plates in different genera within a family, but different families in one order may have different modal numbers.

8. The function of the ring is protection of the eyeball, and support during contraction of the ciliary muscles in the process of accommodation.

9. The ring is heavier and more steep-sided in diving birds than in their relatives which have not this habit. A steep-sided ring is also characteristic of swift-flying birds.

10. From the taxonomic standpoint, the structure of the eye-ring may be of value, considered in conjunction with other skeletal characteristics, in establishing degrees of relationship between neighboring groups.

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EXPLANATION OF PLATE

PLATE 9

Photographs of scleral rings: (1) Golden Eagle; (2) Dusky Horned Owl; (3) Domestic Turkey; (4) Tufted Puffin; (5) California Murre; (6) Saw-whet Owl; (7) Northwest Coast Heron; (8) Northern Pileated Woodpecker; (9) Lesser Loon.

University of Washington
Seattle, Washington

SOME GEORGIA RECORDS OF JOHN ABBOT, NATURALIST

BY ANNA STOWELL BASSETT

ONE hundred and sixty-one years ago there came to Georgia a man who for nearly sixty-five years trod her yellow hills and traversed her valleys and forests in the interests of natural science. His name was John Abbot, well known in England and America as the painter of the 'Rarer Lepidopterous Insects of Georgia.' He was also a keen observer and a painter of the birds of Georgia. Owing to the earliness and the great merit of his bird paintings, he has long been of great interest to ornithologists.

In volume 13 of 'The Auk,' July, 1896, page 20, is an article by Walter Faxon concerning him entitled 'John Abbott's Drawings of the Birds of Georgia.' He tells us that in the Boston Society of Natural History are two volumes of his drawings "one comprising 174 plates, given to the Society by Asa Gray who received it from J. E. Gray of the British Museum, the other comprising 193 plates purchased from Dr. Oemler of Georgia." "There has later come to light in the library of the society a set of 181 water color drawings of birds. One of these plates alone bears the inscription in ink, 'J. Abbot *delin ad vivum*—1810'." According to Faxon's enumeration there are 548 drawings and paintings of birds in the Boston Society of Natural History. He tells us Swainson's Warbler was drawn by Abbot at least twenty-five years before it was described and named by Audubon and that LeConte's Sparrow was known to Abbot and drawn by him about forty years before it was described by Audubon. Rare Georgia birds in the collection mentioned by Faxon are the Snowy Owl, Scarlet Ibis and White-winged Crossbill. In volume 35 of 'The Auk', July, 1918, page 27, under the title 'Georgia's Rarities further discovered in a Second American Portfolio of John Abbot's Bird Plates,' is an article by Samuel N. Rhoads, describing a volume in the DeRenne Library, near Savannah, containing 122 bird plates by John Abbot, making a total number of plates in Boston and Savannah of 670. In 'The Auk' of October, 1906, volume 23, Dr. Witmer Stone published a letter which John Abbot wrote to George Ord, naturalist of Philadelphia. This letter was written from Screven County, Georgia, in March, 1814. In reading these very interesting articles, one is impressed with the absence of knowledge of John Abbot himself.

Several histories of Georgia refer to John Abbot and his work as a lepidopterist. The most detailed reference to him in any history consulted is in White's 'Historical Collections' under Screven County and is as follows: Mr. John Abbot resided for many years in this county and was very much devoted to the study of natural science. The results of his observations he delineated in a style of beauty and accuracy, which gained him a high reputa-

tion in Europe. In the Charleston Library are two large folio volumes, with elegant colored engravings entitled "The Rarer Lepidopterous Insects of Georgia, including their systematic characters, the Particulars of their several metamorphoses and the plants on which they feed" collected from the observations of Mr. John Abbot, many years resident in that country, by James Edward Smith, M.D., F.R.S. A comprehensive statement but with no definite information of time or place. The letter written from Screven County in 1814, quoted by Dr. Stone, and references to his residence in the old dead town of Jacksonborough found in the histories of Georgia gave us the fullest information of him as to time and place of residence found in the authorities consulted. By chance two more dates came to my notice and a faithful search has added others which may be of interest to those seeking knowledge of John Abbot.

John Abbot came to Georgia in 1776. We have two proofs of this. The first is found in a letter written by Alexander Wilson to his friend William Bartram of Philadelphia from Savannah, Georgia, March 5, 1809. It is quoted in George Ord's biography of Alexander Wilson, introductory to Wilson and Bonaparte's 'Ornithology' published by Porter and Coats of Philadelphia, volume 1, page lxvi. In this letter Alexander Wilson devotes one paragraph to John Abbot, stating: "There is a Mr. Abbot here, who has resided in Georgia thirty-three years drawing insects and birds. He has published in London one large folio volume of the Lepidopterous Insects of Georgia. It is a very splendid work." This paragraph gave us three important facts upon which this research is based: first, his coming to Georgia in 1776; second, his residence in Savannah in 1809; third, the establishment of his identity with John Abbot of early Georgia records. The last is very important since in not one of the Georgia records found, is he identified as John Abbot, naturalist or lepidopterist. There is another record establishing the fact of his coming to Georgia in 1776: in the DeRenne Library is an announcement of John Abbot's work on the 'Rarer Lepidopterous Insects of Georgia,' by Ernest Dressel North, 4 East 39th Street, New York, dealer in choice, rare and second-hand books. In his description of John Abbot's work by J. E. Smith, M.D., F.R.S., there is the statement that the original drawings by John Abbot were made in America from Nature during a residence of near twenty-one years. This work was published in 1797, again giving us the date of 1776 for his coming to America. It also states that the insects were observed in Georgia and adjoining States. A careful reading of John Abbot's notes on the insects portrayed, impresses one by its thorough, first-hand knowledge of the insects in Virginia. There are twenty-four comparisons of insects of Virginia with those of Georgia, while there are no comparisons of the insects of the much nearer Carolinas with those of Georgia. Might it not be possible that John Abbot had a

residence in Virginia before coming to Georgia instead of coming to Georgia directly from England?

When John Abbot came to Georgia in 1776, Georgia had a total white population of about seventeen thousand and consisted of villages and forts along the Atlantic seaboard and the Savannah River. The interior was wild Indian country. In 1777, Georgia was divided into eight large counties. Those along the Atlantic were Camden, Glynn, Liberty and Chatham; those above Chatham on the Savannah River were Effingham, Burke, Richmond and Wilkes. In John Abbot's letter to George Ord of Philadelphia quoted by Dr. Stone, he states, "The Islands and lower Country of the Southern parts of Georgia is the great rendezvous of the Water birds but owing to the unhappy times chiefly and other circumstances I have never yet had the pleasure of visiting it." This statement of Abbot's limited our search for records of him to the counties along the Savannah River. Records of him were found in the archives of Effingham, Chatham and Bulloch Counties. The records of Burke County, most important of all, were burned.

The earliest Georgia records of him point to Burke County as his place of residence. He married Penelope Warren and his son, John Abbot, Jr., was born in 1779, the year that the terrors of the Revolutionary War first struck upper Georgia. According to an account of 'The Revolutionary War in Georgia' by Otis Ashmore and Charles H. Olmstead, the first battle of the Revolution was fought at Burke County jail where two hundred and fifty patriots under Benjamin and William Few and John Twigert met and twice defeated four hundred British soldiers who swept across the Savannah River from a pitiless raid in South Carolina. John Abbot was a soldier under Benjamin Few and Elijah Clarke. An inquiry made to the War Department concerning the Revolutionary record of John Abbot brought the following: "The records of this office show that one John Abbott served in the Revolutionary War as a private in the 3rd Georgia Continental Battalion commanded by Lieutenant Colonel John McIntosh. Neither the date of his entry into service nor the date of his separation therefrom is shown. His name first appears on an undated list of officers and men of that organization whose pay has been drawn to January 1, 1779. His name last appears on a pay roll of that organization covering the period from May 1 to July 1, 1779."

As John Abbot was a soldier under Benjamin Few and Elijah Clarke he was probably in the three principal battles in upper Georgia—Burke County Jail, Kettle Creek in Wilkes County and Briar Creek in Burke County, as well as with John McIntosh in southeastern Georgia. That he was a faithful soldier is testified by both Colonel Elijah Clarke and Colonel Comt. Benjamin Few in their certificates of service and their warrants

issued to him for bounty land given him in Washington County as pay for his services. A bounty consisted of two hundred and fifty acres of land with tax exemption for a number of years, or 287½ acres taxable at once.

John Abbot was given 575 acres of land in Washington County on the Oconee River. His bounty warrant signed by Benjamin Few indicates that some mischance befell John Abbot and that his family gave him up as dead, for this bounty warrant is endorsed by Penelope Abbot who as petitioner prays "that land be granted in Washington County to the heirs of John Abbot dec^{est}." He must have been away for some time for John Habersham directed the surveyor to lay out the land for the heirs of John Abbot and it was done. These certificates of service and bounty warrants were given in 1784. Before 1785, John Abbot had returned and John Habersham and his five esquires granted him 575 acres of Washington County land, January 4, 1785. This is recorded in Jardine's second volume of Revolutionary records. The plat surveyed for John Abbot's heirs is not so recorded. The certificates of John Abbot's service and his bounty warrants are in the Georgia Department of Archives and History in Atlanta. In the State House, Atlanta, the plat of John Abbot's 575 acres on the Oconee River, the plat surveyed for the heirs of John Abbot and the two-hundred-acre plat of land given him as a headright in Burke County were found, tracings of which were made.

In the archives of Effingham County, Georgia, Book A and B, page 275, is the following legal paper:

"State of Georgia, Burke County
"Benjamin Warren to John Abbot

"Know all men by these presents that I Benjamin Warren of Effingham Co., planter, for and in consideration of the Sum of One Hundred pounds Specie to me in hand paid by John Abbot of Burke Co. Schoolmaster, the receipt whereof is hereby acknowledged have . . . sold and . . . do deliver unto the said John Abbot Thirty head of cattle in the mark of the said Benjamin Warren, value thirty pounds, Forty head of Hogs, of the same mark, value ten pounds, A bay mare and sorrel colt value eight pounds. Three beds with other household goods and chattels. . . . In witness whereof I have herewith set my hand and Seal the 10th day of March 1787 & in the twelfth year of the Independence of the United States of America.

"Signed, sealed & delivered
"in the presence of
"Richard Rogers, Lina Warren

The
Mark X of
Benjamin Warren"

Many owners of bounty lands sold them. John Abbot may have sold his land in Washington County to outfit his home in Burke County. At a time when thousands of acres of land were being given away one hundred pounds was a fair price for 575 acres of wild land. An effort to trace the history of the 575 acres has been unsuccessful thus far, since it has not yet

been located, due to the division of the original County of Washington into several counties and parts of counties and the destruction of many records by fire. John Abbot and his wife probably started out simply—busy young people, she with her housework and young son, John with his work as planter, schoolmaster and naturalist. After the invention of the cotton gin, 1794–95, slave labor became more common in upper Georgia. John Abbot became prosperous, owned several slaves and had a comfortable and commodious home. We know this from a deed of gift found in the Chatham County archives:

"Chatham Co. Ga. Records Book 2 I. p. 454–455

"State of Georgia, Bulloch Co.

"This Indenture made this fifteenth day of January in the year Eighteen hundred and twenty and forty year of the Independence of the United States of America Between John Abbott Sen^{r} of the County of Bulloch in the state aforesaid of the first part and Thomas Greene of Scriven County, Trustee of Mrs. Eliza G. Abbott of the other part Witnesseth, that the said John Abbott Sen^{r} for and in consideration of the love and affection which he bears unto his daughter in law the said Mrs. Eliza G. Abbott as also the sum of Five dollars to him in hand paid by the said Thomas Greene Trustee as aforesaid Hath given . . . unto the said Thomas Greene the following named negroes Ned, Hezekiah, George and a mulatto woman named Frankey and her future issue and increase, and the goods, household Stuff and furniture, chattels and effects mentioned and expressed in the Schedule herein to annexed. To have and to hold . . . In trust and to the intent and purpose that he the said Thos. Greene . . . do and shall permit the said Mrs. Eliza G. Abbott to have, hold, possess and use the said negroes . . . and to receive and take all Sum or Sums of money earned by them and all profits of what nature soever accruing or to accrue from their labor from henceforth and for her own use and benefit forever . . . Not subject to the debts or control of her present husband John Abbott, Jun^{r} or any husband with whom she may hereafter intermarry.

"In witness whereof I have hereunto set my hand and seal the day and year first written.

John Abbot Sen^{r} L. S.

"Sealed and delivered in the presence of
John Greene
John Womack } . . .

"Received January twenty fifth eighteen hundred and twenty from Thos. Greene Trustee of Mrs. G. Abbott five dollars the sum within specified.

John Abbot sen^{r}"

"Schedule or Inventory of the goods and chattels referred to by the deed:—4 Feather Beds & their furniture 8 single matresses & their furniture, 7 large matresses & their furniture, 1 Mahogany dining Table, 1 set dining Tables with ends, 1 mahogany wash stand, 1 mahogany candle stand 1 mahogany T. Table 2 Mahogany Bureaus, 1 Mahogany Toilet Glass with one draw 1 Toilet Glass 1 large mahogany side Board, 1 Pine table Say Slab, 1 large pine Table, 3 small pine Tables, 1 Mahogany Bedstead, 10 pine and other bedsteads 1 Mahogany writing desk, 18 chairs, 2 Trunks, 1 Set of china, 2 pr. decanters, 2 doz. Tumblers 1 doz Carved Wine Glasses,

3 doz. plates, ½ doz. dishes, 3 Tea Trays, 1 Set flower pots, 1 Mahogany Knife Box, 1 doz Silver Table Spoons, 1 doz do Tea do 1 Silver ladle, 1 Riding chair and harness 2 Horns Saddle and Bridle, 1 Two horse Waggon and harness, 4 cows and calves, with all my household & Kitchen furniture of every Kind now in her possession.

Recorded 25 January 1820"

The house furnishings indicate a home of hospitality and good cheer where friends met together. The two-horns saddle suggests that his wife rode with him on his excursions when he did not go in his riding chair. It seems safe to refer to the twenty odd years of John Abbot's life spent in Burke County as the happy years of his life.

Just what happened or when it happened is not recorded but something did happen to change all this. Most likely it was the death of his wife. At any rate we find John Abbot, Sr., and John Abbot, Jr., in Savannah where they are listed as taxpayers in 1806. John Abbot, Jr., made the tax returns amounting to one dollar, eighty-five cents and five mills.

Letters for John Abbot, Sr., are advertised in Savannah papers for the next seven years through 1812, but the papers reveal very little of him. We know, however, that he had some congenial friends in Savannah. One of them, Dr. Augustus G. Oemler, was like Abbot, a student of insects and drew them well. During Alexander Wilson's stay in Savannah he wrote in the letter to William Bartram, quoted above, "I have been on several excursions with him [John Abbot]. He is a very good observer and paints well." Wilson frequently quotes Abbot in his writings.

In John Abbot's letter to George Ord written from Screven County, March, 1814, he shows discouragement, saying, "At the commencement of the War I had undertaken to make a collection of stuffed Birds and as complete a collection of drawings of them in colors as I was able for a Gentleman in England but last fall in despair of seeing peace restored, I retired into the country after having made about 220 drawings throwed away a large collection of stuffed skins, have entirely laid it aside and entered into another line of employment where I am in hopes the Mad and destructive ambition of the rulers of the world can but little interfere."

A word of explanation about Screven County may be in order here. When John Abbot came to Georgia in 1776, Screven County had not yet been formed. It was formed from Burke and Effingham Counties in 1793. The old town of Jacksonborough, with which his name is most frequently associated in the Georgia histories, was situated on Beaver Dam Creek, a branch of Briar Creek which, according to White, ran its length in Burke County. This territory is now part of Screven County. After 1820, John Abbot is described in legal papers as of Bulloch County.

John Abbot, Jr., spent the remainder of his life after 1806 in and about Savannah. References to him in the newspapers and deeds are numerous.

These references may explain the change in his father's fortune. In 1808 The John Abbot, Jr., Company is advertised as defaulters in paying taxes. In the 'Republican and Savannah Evening Ledger,' March 10, 1808, one Alex McCarthy voices his protest against Mr. John Abbott for prejudicing Mr. Warren, an uncle of John Abbott, against McCarthy's honesty in weight of sugar sold. This gives us our one clue to the maiden name of the wife of John Abbot, Sr.

In 1810 a business partnership of John Abbot, Jr., and Burrel Lathrop is dissolved by mutual consent, the business being continued by Burrel Lathrop.

In the 'Republican and Savannah Evening Ledger,' April 9, 1812, is the following item:—"Married on Tuesday evening last by the Rev. Mr. Kollock, Mr. John Abbot, Jr. and the amiable Miss Elizabeth Rawls both of this city."

In 1813, John Abbot, Jr., bought forty-five acres of land three miles out on the old Augusta Road. He called the place Three Mile and made his home there for a few years. In 1816, a mortgage was put on Three Mile and a negro woman to secure a debt of $1,000 to Mr. James Jones of Screven County. This debt was to be paid in one year in the penal sum of $2,000. This mortgage was sealed and delivered in the presence of John Abbot, Sr., and Francis Jones. Across the face of this legal paper is written "Account Satisfied." One wonders who satisfied it. In 1817, the holdings at Three Mile were sold.

In Savannah's archives are many records of John Abbot, Jr. In them he is described as a merchant, a trader (of slaves) and an attorney. According to Savannah Death Records which go back to 1803, John Abbot died August 18, 1826, at the age of forty-seven years, of liver complaint, Dr. Screven. His address was on Bryan Street, Old Franklin Ward. Occupation, watchman.

There are many records of Eliza G. Abbot, wife of John Abbot, Jr., both in Chatham and in Effingham Counties. For the most part they are omitted as having little bearing on our subject. The following records may prove of interest:

Effingham County Book K. p. 359

Through Thos Greene of Screven County, Trustee for Eliza G. Abbot, John Abbot Sr. gives Eliza two slaves named Sarah & Betsey.

Idem Book L. p. 29

John Womack, Administrator of Wm Womack, gives Eliza G. Abbot two slaves named Lewis & Cesar through her Trustee. Both gifts are protected from the debts or control of John Abbot Jr.

The last records found of Eliza G. Abbot are in Chatham County, Book 30, p. 390:

"State of Georgia
Chatham County Appeared David Bell aged 75 years, a credible witness, to me well known, who maketh oath and saith that he was present and saw John Abbot & Eliza G. Rawls lawfully married in Savannah in the month of April in the year 1812, by the Rev. Henry Kollock of the Independent Presbyterian Church, that the said John Abbot died in 1826 and that the said Eliza G. Abbot is still a widow.

DAVID BELL"

"Sworn to before me
Oct. 16th, 1855. R. RAIFORD J. P.

On the same page of the same book is a similar sworn statement made by John G. Blance aged fifty-nine years. This gives the date of the wedding as April 7, 1812. This statement was made October 25, 1855. If John Abbot, Sr., had other children besides John Abbot, Jr., or if John and Eliza Abbot had children, no record has been found of them. Could Eliza G. Abbot as legal heir of John Abbot, Sr., through her marriage with John Abbot, Jr., have been establishing a claim to an inheritance coming to John Abbot, Sr., from England?

In the court house at Statesboro, Bulloch County, are two papers signed by John Abbot. On September 20, 1826, one month after his son's death, he files a statement concerning his ownership of a slave named Betty or Betsey, to protect himself against the claim of his daughter-in-law to whom he had given a slave of that name in 1821.

The last record of John Abbot we have found is in Record Book N. 5, p. 292 as follows:

"Bulloch Co. Ga.

"Know all men by these presents that I John Abbot of the county & state aforesaid for divers good causes and considerations and the good will and affection which I have and bear to and for my beloved friend Wm E. McElveen of the same place to all persons to whom these presents shall come Know ye, that I John Abbot do fully give and grant unto the said Wm McElveen his heirs and assigns my negro woman named Betsey which said negro is in his possession at this time also all my personal property or effects that I have at my decease to take in his possession as soon as I die without any manner of condition whatever from that time henceforth to be the sole property of the said Wm E. McElveen his heirs and assigns for ever against the claim of all or any other person whatever In witness whereof the said John Abbot hath hereunto set his seal this 4th day of June, 1839

John Abbot

"Witness
"Preston Wise
"M. Denmark, S. S. C. B. C.
"Recorded Oct. 24, 1839."

Although these records add somewhat to our knowledge of John Abbot, the dates of his birth and death are still unknown. White in his 'Statistics of Georgia,' published in 1845, states that Mr. Abbot lived to an advanced age. This places the time of his death between 1839 and 1845.

Through the kindness of Dr. R. J. H. DeLoach of Statesboro, Bulloch County, Georgia, we have met and talked with descendants of men who knew John Abbot. One of these, Mr. Howell C. Cone of Savannah, remembers that his grandfather Aaron Cone, born in 1810, collected for John Abbot, as a boy. He and a sister especially remember hearing of a hummingbird and its nest which he collected.

Through Mr. John Oemler of Wilmington Island, a grandson of Dr. Augustus G. Oemler, friend of Abbot, we have a valuable clipping from the 'Morning News' of May 1, 1925, page 16. It is here given in full:

"The recent purchases of real estate by Henry Ford in Bryan county and the publication in the Morning News of Sunday, April 19, of John Burroughs' suggestion to him some years ago to buy Georgia coast land, has recalled to W. H. Cone, proprietor of the Ivanhoe farms, Ivanhoe, an interesting bit of history about John Abbott, another naturalist, who visited here many years ago.

"While John Burroughs was during life probably the most famous American naturalist, John Abbott, an Englishman, who lived on the Ogeechee river, appreciated and wrote authoritative treatises on his experiences in this section of the state. Mr. Cone's story is as follows:

"'In the early part of the nineteenth century there lived in Bulloch county an Englishman by the name of John Abbott, who seemed to represent some society in London. He was an expert painter and taxidermist and collected specimens of all the insect and bird life of this part of Georgia usually a pair of each kind. With each specimen he wrote a description. All of this work was forwarded to England and is now preserved in the British museum in London, and is regarded as one of the finest works on American ornithology.

"'Abbott seemed to live the life of a hermit in a little log hut and was well supplied with funds to pay his expenses in collecting and from time to time shipping his collection to London. This information was received from my father who was born in 1810 and as a boy was employed by Abbott to collect specimens for him. My father made quite a bit of pocket money at the work and saw much of Abbott's work which interested him greatly.

"'He had specimens of several kinds of birds not now in existence here, such as the ivory-bill woodcock, the sandhill crane, six varieties of wild ducks, wild pigeons, and perhaps others I do not call to mind now. I saw an extract of a letter written by John Abbott to his connections in London, the last information which was ever received by them from him, when he was eighty-five years old, and it was as follows: "I am living on the west side of the great Ogeechee river about a day's ride from Savannah, Ga." Evidently he died soon after. I have tried to locate his grave but have been unable to find where he was buried.

"'I don't know whether this information is contained in any of the

historical works about Georgia or whether there is anyone in Savannah who has any record of the work of John Abbott, but it seems to me that his work is worth recording.'"

William H. Cone was born in December 1850, and died in January 1931, at the age of eighty. He was the son of Aaron Cone, born in 1810, who collected for John Abbot. Mr. Howell C. Cone told me that his father stated that John Abbot died without returning to England. The tradition in the Cone family is that John Abbot died on the Slater Place, three miles from the home of Aaron Cone and his son, W. H. Cone. That may have been where he lived when Aaron Cone collected for him as a boy. The deed of gift to William E. McElveen in 1839, however, authentically links John Abbot's last days with the McElveens. John Abbot's friend William E. McElveen owned a fourteen-hundred-acre tract of land bordered by Black Creek and its tributary, Pole Branch. Black Creek flows into the Great Ogeechee River from the west near Meldrim, Georgia. Mr. Barber McElveen lives on the old place. The house occupied by William E. McElveen is gone and the son lives in a new house nearer the road. Near the site of the old home is the old McElveen cemetery where he and others of his family are buried. On the stone erected to William E. McElveen is:

"William E. McElveen
Born Dec. 29, 1812
Died Mar. 22, 1880
Our father was takened
To the palace above
Where he is now resting
Like an innocent dove."

It was erected by his seven youngest children. William E. McElveen had twenty children by two wives. We met two of his younger sons by his first wife, venerable gentlemen with snowy hair and keen blue eyes, in their eighties. One of them, Rev. Dan McElveen, told us that John Abbot lived in a small house on the part of his father's plantation called Hudler's Field.

Through Miss Vera McElveen, whose home is on the old place, we have a letter from her uncle, Paul R. McElveen, of Lyons, Georgia. He says, "In reply to your letter of July 18th, I understand that father did let a man Abbott and his slave live in a house in the Hudler field in the fork of Stone and Iric branches, and that at Abbott's death he had deeded his slave and his other personal property to father. I do not know about the date of his death.

"As to where he was buried, I remember distinctly hearing father say that Abbott was buried in the old family cemetery on your father's place. I also remember that on one occasion father passed by the cemetery and saw some of his (father's) children standing around Abbott's grave and

heard them calling to Abbott, 'Grandfather, get up.'" These were, of course, William E. McElveen's oldest children who knew John Abbot. John Abbot was not related to these children, but we all know of instances where children have claimed kinship with those they love and "Grandfather" was their name for John Abbot. These records are from reputable people.

Whatever marker was placed for him has long since disappeared. Perhaps John Abbot preferred to have his worn-out old body lie in an unmarked grave in Georgia soil and that his only monument be his beautiful paintings of her butterflies and birds.

Acknowledgment is hereby made of my indebtedness to Mr. Ivan R. Tomkins of Savannah, who, some years ago, loaned me his transcription of the articles in 'The Auk' by Dr. Faxon, Mr. Rhoads, and Dr. Stone, quoted in this paper.

1010 East Park Avenue
Savannah, Georgia

TWO SOUTHERN PETRELS IN THE NORTH PACIFIC

BY JAMES MOFFITT

MATERIAL in the ornithological collection of the California Academy of Sciences indicates that two petrels, heretofore regarded as almost exclusively of South Pacific oceanic distribution, occasionally range so far north as to occur off the coasts of California and of Lower California. Since the localities of the birds' capture are situated approximately 685 and 175 miles west of the respective coasts, they may be considered to lie within the scope of the American Ornithologists' Union 'Check-list of North American Birds.' Hence, the forms are entitled to recognition in the 'Check-list,' to which they constitute additions as follows:

PTERODROMA LEUCOPTERA MASAFUERAE Lönnberg

Five examples of this bird were collected by R. H. Beck in latitude 33° 6′ N., longitude 134° W., and in 35° 40′ N., 133° 10′ and 14′ W., on November 14 and 19, 1906, respectively. The last locality is about 685 statute miles west of Piedras Blancas, San Luis Obispo County, California. Loomis (Proc. California Acad. Sci., ser. 4, vol. 2, p. 92, 1918) provisionally referred these birds to *Pterodroma longirostris* (= *Pterodroma leucoptera longirostris*) (Stejneger) because he lacked comparative material. Since the Academy still lacks adequate examples of the races of this species, three of the specimens were recently sent for subspecific identification to Dr. R. C. Murphy of the American Museum of Natural History, at the instigation of Dr. Joseph Grinnell, who desired this information for his work on a revised list of the birds of California. Grateful acknowledgment is hereby made of Dr. Murphy's kindness in providing his authoritative determination of the specimens, by his letter of March 19, 1937, as follows: "Your birds represent *P. l. masafuerae* which is known to breed only at Mas Afuera Island, Juan Fernandez group, Chile. The specimens therefore establish a great extension of range, for I had hitherto been able to find examples of this race only from waters close to the Juan Fernandez group ('Oceanic Birds of South America,' p. 720, 1936). The only way in which your three birds differ from examples in our Mas Afuera series is that all three of the North Pacific examples, which were taken in November, have fresh and not fully grown primaries. For this reason the white wedge on the outermost quill seems a little less extensive than among examples from the breeding grounds, but I believe that the difference is entirely due to state of plumage. . . . I have compared your specimens very carefully with all of the five known races of *leucoptera*, and it is quite evident that they can represent only *masafuerae*."

Loomis (loc. cit.) lists museum numbers, sexes and measurements of the five Academy specimens. No. 1145 was recently exchanged with the American Museum of Natural History for a male *P. l. masafuerae* collected February 9, 1914, by R. H. Beck, off Mas Atierra Island, Juan Fernandez group, Chile, which is now no. 42583, C. A. S. Comparison of this bird with the remaining four Academy examples of the race confirms Dr. Murphy's contentions. The five specimens are practically identical, save for the exception already noted by Murphy and for the slightly deeper shade of the mantle in the near-topotypical bird, a difference which also is doubtless only seasonal. Average measurements of C. A. S. nos. 1141–1144 as contrasted with those of the Mas Atierra specimen follow and the first agree fairly well with Loomis's tabulation, save as regards tarsus, a difference probably due to technique. As Gifford did for Loomis, the wing measurements here provided were made with the primaries flattened on a rule, hence they are greater than the customary 'chord' dimension.

	Wing	*Tail*	*Culmen*	*Tarsus*	*Mid-toe + claw*
Nos. 1141–4.....	211	90.5	24.8	28.1	33.5
No. 42583.....	213	95	24.2	28.8	34.1

All measurements of the last specimen are within the ranges of variation for equivalent dimensions of the first four birds. The above measurements, except those of the tarsus, are less than the averages for this race provided by Murphy (loc. cit.) and the wing and tail dimensions are below his minima. The discrepancies are perhaps best explicable by reason of different workers and technique, but incomplete growth may in part account for the small dimensions of wings and tails in the North Pacific specimens.

Murphy (loc. cit.) gives the much higher extension of white on the forehead of *masafuerae* as a character distinguishing the race from the typical form, *leucoptera*, stating that the extreme breadth of white forehead, measured from base of culminicorn, is from 12 to 13 mm. in the latter against an average of 23 mm. in *masafuerae*. In the first four specimens tabulated above, it averages 21.5 mm. and in no. 42583 it is 23 mm.

OCEANODROMA TETHYS KELSALLI (Lowe)

In the course of routine curatorial work on the Academy's bird collection, there were lately noted among the large series of Galapagos Storm Petrels (*Oceanodroma tethys tethys*), thirteen skins of conspicuously small size. Measurements of the entire series indicated that the small ones were of appreciably less dimensions than any of the remaining seventy-four specimens. Measurements of these thirteen birds, with a single exception, agree closely with those claimed for the race *kelsalli* by its describer Lowe (Bull.

British Ornith. Club, **46**: 6–7, 1925) and with the more ample ones provided by Murphy (loc. cit., p. 731). The exception, C. A. S. no. 371, has a wing length of 135 mm. which is well within the range of that of the typical form, but its other dimensions are those of the smaller race, to which all are here referred. This specimen's wing length is omitted from the table of measurements below, but its other dimensions are included. Also omitted, are wing lengths of seven of the remaining twelve small birds, because the molting condition of their wings prevents obtaining maximum measurements.

Twelve of the examples referred to *kelsalli* were collected by the Academy's Galapagos Expedition on July 22, 1905. Nos. 365, 415, 420 and 426, males, and nos. 358 and 372, females, were secured in latitude 22° 30′ N., longitude 112° 39′ W.; while nos. 367 and 419, males, and nos. 362, 364, 366 and 371, females, were taken five minutes south and one minute west of the above position, which is approximately 175 land miles west of the tip of the peninsula of Lower California. The Academy's thirteenth representative of this race, no. 38403, female, was secured in latitude 16° 45′ N., longitude 100° 28′ W. (about forty statute miles west-southwest of Acapulco, Mexico), on September 22, 1933, by Captain W. A. Card of the S. S. 'Antigua,' who presented the bird to the museum. This petrel is in complete fresh plumage and its greatest wing length is 126 mm. In view of the Galapagos Expedition examples of *kelsalli*, its capture suggests that the form may range regularly north to Mexican offshore waters.

Measurements (average, minimum and maximum in millimeters) of the Academy's six male and seven female specimens of *kelsalli*, with wing exceptions noted above, follow. In this race, culmen averages are based on but eleven skins, since two have defective bills. For comparison, dimensions of ten male and ten female examples of the typical race are provided from Academy specimens taken close to the Galapagos Islands.

	O. t. kelsalli	*O. t. tethys*
Wing	124 (119–126) mm.	136.2 (130–143) mm.
Tail	58 (55–61)	59.8 (56–65)
Culmen	11.46 (11–11.8)	12.45 (11.2–13.2)
Tarsus	20.8 (20.4–22)	22.2 (21–23.7)
Mid-toe + claw	18.1 (17.2–19)	19.2 (18–20.8)

It seems odd that neither Loomis nor Swarth commented upon these small skins among the series of *Oceanodroma tethys*. Loomis (loc. cit., p. 154) provides measurements derived from seventy-one of the Academy's ninety-two Galapagos Expedition specimens of the species (six have since been disposed of by exchange). While the writer has in this paper already shown that Gifford's and his own measurements do not conform, the dis-

crepancies in wing lengths of the small petrels under consideration are too great to be so explained. It appears likely that Loomis discarded measurements of the small skins from his table, presumably on account of the state of molt in which most of these birds are engaged. Thus, all, or most of the twelve small ones may have been among the twenty-one skins omitted from his table of measurements. This supposition is further strengthened by the fact that of the specimens here referred to *kelsalli*, only no. 371, the individual with extremely long wings, is included in Loomis's detailed measurements of twenty-six specimens (loc. cit., p. 155).

Loomis (loc. cit., p. 151) mentions (fide E. W. Gifford, field notes) that the southbound expedition first observed Galapagos Petrels on July 21, 1905, in latitude 23° 32′ N., longitude 113° 4′ W. Since all of the birds secured on the following day are here referred to *kelsalli*, it appears that those first seen were also of this kind and that the position marks their northernmost locality of record. The Academy specimens extend the known range of this small petrel northward about thirteen degrees of latitude, the previous northernmost locality being off Panama (Lowe, loc. cit.).

Gifford's notes aver that petrels of this species were frequently encountered by the southbound expedition subsequent to July 22, 1905, but since no specimens were taken until three days later, in latitude 19° N., longitude 112° W. (nos. 357, 395 and 403), and are clearly birds of the typical form, it is impossible to determine where examples of the small race ceased to be encountered and were replaced by *tethys*. That the position in which the species was first noted may mark approximately its northern limit in this latitude is suggested by Gifford's observation (Loomis, loc. cit.) that Black-footed Albatrosses here ceased to be seen, a fact which indicates that a change in oceanic environment probably occurs in the locality. After July 25, 1905, all examples of the species preserved by the Galapagos Expedition are of the typical form, the last one having been collected on the homeward voyage, October 12, 1906, in latitude 15° 40′ N., longitude 110° 12′ W. It is a source of regret that no example of the series of *Oceanodroma tethys* collected by Beck for the Academy at Banderas Bay, Mexico, in June 1903 (Loomis, loc. cit., p. 152), is known to exist, since all were presumably destroyed by fire in 1906; for in view of our present information some of these would seem more likely referable to *kelsalli* than to the typical form.

In order to substantiate the writer's identification of the small petrels as belonging to the form *kelsalli*, C. A. S. no. 362 was sent to Dr. Murphy for comparison with examples of the race in the American Museum of Natural History from the coasts of Ecuador and Peru. We are again indebted to Dr. Murphy for his cooperation and conclusions afforded by letter as follows:

"I have now measured and compared this specimen (No. 362) and find that it certainly represents the race *kelsalli* as you had already concluded. My measurements prove to agree almost exactly with those in your letter, the length of the wing coming out 123 mm. instead of 122."

The case of *Oceanodroma tethys* would seem to add a form to Swarth's (Biol. Rev., **9**: 213–234, 1934) meager list of South American species with representatives in the Galapagos Islands, but whether this bird is to be considered endemic to the continental west coast or to the Islands, is problematical.

In summary, material in the California Academy of Sciences extends the known pelagic range of *Pterodroma leucoptera masafuerae* north to latitude 33 degrees in the Pacific Ocean, and that of *Oceanodroma tethys kelsalli* probably regularly northward to off the west coast of Mexico, at least occasionally north to 23° 32′ N. latitude; and further it indicates that *Oceanodroma tethys tethys* is not known to range farther north than latitude 19° 42′ N.

California Academy of Sciences
San Francisco, California

THE EASTERN COWBIRD vs. THE KENTUCKY WARBLER

BY J. WARREN JACOBS

THESE observations concerning the effect of the Cowbird's imposition upon the number of eggs laid by the Kentucky Warbler, began in the latter part of May, 1886, when I found a nest, new to me, which had been trodden upon by cattle roaming through a moist woodland patch. A single egg which I felt certain was of parasitic origin, a Cowbird's, was all the evidence that the nest had been occupied. After a study of the big bulky nest and some inquiry, I decided that the erstwhile owners were Kentucky Warblers (*Oporornis formosa*). So my acquaintance with the nesting of this bright yellow-breasted woodland warbler began fifty years ago, this past summer. During the long period of years since then, I have looked into perhaps more than three hundred nests of this species within the countryside surrounding Waynesburg, Pennsylvania; and like the first nest of a half century ago, the last one I looked at (June 7, 1936) also contained a parasitic egg of the Cowbird (*Molothrus ater*). The three warbler's eggs were pipped, so I cast out from their midst the interloper's egg, that the rightful owners of the nest should not have to care for a come-by-chance forced upon them. My records show well-detailed accounts of about one hundred and fifty of these nests and their contents. A recent study of these reveals some interesting data on the case of the Eastern Cowbird vs. the Kentucky Warbler. The first nest I found with authentic Kentucky Warbler's eggs, was on June 5, 1887; it contained two eggs of the warbler besides one of the Cowbird. The nest, large and bulky, was tucked between two may-apple stalks, close to the location of the 1886 despoiled nest. The birds were near, to make identification certain. More eggs might have been laid, for I found them to be quite fresh; but remembering the destruction of a nest in the same nook the previous year, I decided that I would take these for my, then, small collection. Long ago these eggs passed out of my hands, so I cannot recall their varietal type.

On May 29, 1888, I found a pair of Kentucky Warblers just beginning the foundation of a large bulky nest which consisted almost wholly of dry oak, beech and maple leaves, loosely piled together. Quietly concealing myself at a short distance, I watched the birds at work for an hour. Two days later I revisited the nest and saw the birds putting the finishing touches to the lining of the now neatly cupped top wherein was used much wild-grape-vine bark, weed stems and fine rootlets. On June 1, the lining was complete. Hoping for a full clutch of eggs, I left the birds and nest undisturbed until June 10, when I found four beautiful eggs in the nest, still fresh, without even an egg of the interloping Cowbird to mar their beauty. These eggs

are now before me, none the less clean and beautiful after the lapse of almost forty-nine years. I pause to admire them and experience a peculiar thrill in remembering the incidents surrounding their collecting and the further historical interest centering in the specimens, for this set of Kentucky Warbler's eggs represented the species in my collection of Pennsylvania birds' eggs at the Chicago World's Columbian Exposition in 1893.

But to return to the subject of the Cowbird's interference in the deposition of full clutches of the Kentucky Warbler: of the 133 complete records, I find that forty-two nests contained five eggs each; only eight of these nests contained eggs of the parasitic species, but in one case, the Cowbird had deposited two additional eggs. The comparison would be, approximately, 81 per cent free of the interloping species against 19 per cent containing the outsider's egg. Nests which held four warbler's eggs suffered more; for of fifty-six nests, thirty escaped the Cowbird's intrusion, twenty-two had received one egg each, two eggs had been dropped in each of three nests, and one nest had been victimized with three Cowbird's eggs. Nine nests containing only three warbler's eggs each had not been visited by the Cowbird, while in twenty-six similarly situated nests I found the parasitic eggs, one in each of fifteen nests, two in each of eleven nests, and three in one other nest.

Of the total of 133 complete records entering into these computations, the percentage of nests escaping and of nests victimized by the parasitic species, averages more nearly the same in the warbler's sets of four eggs, than in either the large full sets of five, or the smaller sets of three eggs. By way of summary:—

Of forty-two nests containing five eggs each thirty-four (or 81%) contained no Cowbird's eggs, eight (or 19%) did hold Cowbird's eggs.

Of fifty-six nests containing four eggs each thirty (or 54%) contained no Cowbird's eggs, twenty-six (or 46%) did hold Cowbird's eggs.

Of thirty-five nests containing three eggs each nine (or 26%) contained no Cowbird's eggs; twenty-six (or 74%) did contain Cowbird's eggs. All these records, when taken as a whole, show that nearly one half have been interrupted by the Cowbird, seventy-three escaping, while sixty were victimized. The comparison is 55 per cent escaping, while 45 per cent bore the extra burden.

In the seventy-three nests here cited where no interference from the Cowbird was experienced, the preponderance of full sets of five brings the average number of warbler's eggs to 4.3 per nest. On the other hand, the sixty nests victimized by the Cowbird show an average of 3.8 warbler's eggs per nest. The comparison is 0.5 Cowbird's eggs to each two nests; in other words, one pair of breeding Kentucky Warblers out of every four, is due to lose one egg from its normal laying. Without the Cowbird's intrusion I

believe the normal complement of eggs of this warbler would be either four or five in nearly equal proportion with the deposition rarely ending with only three eggs.

But this does not reveal the complete story of the decreased size of Kentucky Warbler broods through the intrusion of the Cowbird. There are two other factors upon which I have not as yet commented, that would I believe affect the verdict against the parasitic species, if the actual facts could be ascertained as plainly as from my recorded data. These factors are: first, that occasionally (perhaps once in ten nests containing the parasitic eggs) one or more of the warbler's eggs are rendered sterile by shell punctures resembling claw marks. Secondly, numerous nests of this warbler are found deserted, even before they are finished; others may contain one or two eggs, but, still for some undeterminable cause, are abandoned. Although practically all the egg damage can be blamed on the interloper, the majority of these nest desertions bear no evidence of the Cowbird's interference. On the other hand, many of these abandoned nests contain one or more eggs of either the warbler or the impostor, or both. I believe that herein is evidence of greater detriment to the number of warbler's eggs, for many of these curtailed sets had progressed, more or less, in incubation. This factor in the case should, I believe, result in one Kentucky Warbler's nest out of each three suffering a loss of one egg from the normal clutch number.

While it is evident that this warbler rarely rears a second brood in a season, the birds are persistent in their efforts at success, and immediately upon the loss or abandonment of one nest, will set about building another. This accounts for finding nests at any time from May 18 to July 10, with the height of the nesting season about June 1. These later layings possess one advantage against possible intrusion by the Cowbird, to the extent at least that since the nests are placed upon the ground, usually in the midst of quick-growing woodland vegetation, this forms an increasingly concealing barrier to the Cowbird's prying eyes as the summer season advances with the result that it finds fewer of these second or later efforts of the warbler.

Waynesburg, Pennsylvania

VIBRATION FREQUENCIES OF PASSERINE BIRD SONG[1]

BY ALBERT R. BRAND

THE recording of bird songs on film produces a medium from which sounds can be studied objectively; hence we need no longer rely entirely on aural impressions. There, on the film, is printed in black and white, on a sound track of varying density or varying area, depending on which of two methods of recording has been used, the picture that the physical vibrations have made upon the sensitized film. The number of these vibrations per second determines the pitch of a sound. For example: a sound of 4096 vibrations per second is pitched at the highest note of the piano keyboard (C_7) and is said to have a frequency of 4096. Bird songs may also be recorded directly on wax, from whence phonograph records can be manufactured. This method, while satisfactory for purposes of reproduction, is not so accurate as film for objective study. In 1934 in Germany, and in 1935–37 in England, Ludwig Koch recorded bird songs directly on wax. He reports on the pitch of some ten passerine bird songs (Nicholson, E. M., and Koch, Ludwig, 'Songs of Wild Birds,' London, p. xxviii, 1936). The data are, however, fragmentary; he gives only the highest and lowest frequencies found. Those he reports on are lower, so far as the highest notes are concerned, than the results of my studies would indicate for American birds. The highest frequency he mentions is 5500 for the Yellow-hammer (*ibid.*, p. 3). But one gathers from what he writes that it is unlikely that he is getting all the highs present in bird song; probably somewhere in his apparatus he loses or partially suppresses them. There are a number of places where this loss is likely to occur. Unless microphone, amplifiers and recorder are very carefully coordinated and specially constructed, this is inevitable; in addition, it is doubtful whether it is practical to construct a disk recorder such as Koch uses, that will reproduce much over 5000 vibrations per second. In other words, songs containing frequencies over 5000 vibrations would probably be reproduced only in part in disk recording. On film, however, we have recorded in Nature, bird and insect sounds of a frequency of over 10,000 vibrations, and we have made laboratory tests up to 17,000. It is therefore unsafe to include these European recordings in our calculations, at least until numerically far more studies have been made than are yet reported, and until we have definite proof that these recordings include the higher frequencies.

In almost every case my studies were made from original negative film, produced by either the variable-density or the variable-area recording

[1] Read at the Fifty-fifth Stated Meeting of the American Ornithologists' Union, Charleston, November 17, 1937.

method. Perhaps half a dozen studies were made from positive prints. Variable-area and variable-density films give essentially similar results, with the main difference that varying-area track produces more visual detail than one of varying density. As at present we are concerned with the pitch-giving frequency of the songs of birds, either type of recording is satisfactory for study. Were we discussing the important factor of bird song, quality, or what musicians call timbre, we should find variable-area film more valuable for study. But thus far, in most of the studies, I have not attempted to analyze the sound further than to discover the main or pitch-giving frequency; and these remarks are restricted to pitch. The study of quality is highly involved, requiring in most cases a study of complicated wave shapes in order to determine the overtones or harmonics. This necessitates intricate mathematical calculations. It is agreed that quality—that which enables us to recognize a Meadowlark's note immediately, and not to confuse it with, let us say, a warbler's note given on the same pitch—is of fundamental importance. At some future time I hope to have sufficient material to offer the results of investigations on that phase. For the present, let us restrict our considerations to the main pitch-giving frequency.

In the past few years, in the Laboratory of Ornithology at Cornell University, we have studied intensively under a low power of magnification (25 diameters), several hundred pieces of film comprising the songs and calls of about one hundred species of birds. In order to simplify matters, I am in this paper, considering songs only. That is, I have taken what is generally accepted as song, and given the results; and in order to simplify further, I shall consider only passerine song. Thus I have reduced the results so that we have studies of fifty-nine passerine bird songs. The families and the number of species included are as follows: Tyrannidae, six; Corvidae, one; Paridae, one; Troglodytidae, three; Mimidae, one; Turdidae, six; Bombycillidae, one; Sturnidae, one; Vireonidae, three; Compsothlypidae, sixteen; Icteridae, six; Thraupidae, one; Fringillidae, thirteen. These species were selected at random and give a fair general sample of passerine song.

Almost no bird notes remain on the same pitch from instant to instant. That is, birds almost invariably slur either upward or downward, and often in both directions. I have attempted to estimate the bird songs on what appears to be the approximate mean of all frequencies in a note, and also the mean of the song.

Though a note may contain a very short portion (sometimes 0.002 seconds in duration) of either excessively high or rather low frequency, I have attempted to approximate the main pitch of the note, which in many cases, is the pitch of longest duration and sometimes the pitch which is

loudest. In many notes the pitch is changing constantly, and in these cases I have, as nearly as possible, estimated the average. While it is possible to count accurately the frequencies, these estimates are merely approximations. However, they are correct within, let us say, two or three per cent. Thus a note which I have called a frequency of 5000 vibrations might be 4850 or 5150, but the error will rarely be greater than that, and in most cases is considerably less. These differences are so slight as to be negligible, being less than one-quarter of a note. Errors may occur, in the following ways. In making a recording, the motor that drives the film through the recorder may occasionally be slightly slow or fast. However, this is very carefully watched, and it rarely happens that the film speed is not accurate; and when it is not, the difference is so slight as to be negligible. In estimating frequencies by inspection no attempt is made at absolute accuracy. Here again the introduced error is very slight. This has been proved a number of times by estimating independently, on separate days, the results of the studies of successive songs of the same bird. The results of these checks are always the same. The introduced error of estimation is very small; often two separately made counts give absolutely identical results. We thus have assurance that the method used is accurate for all practical purposes.

Of the fifty-nine songs included in this study we find, by the method described, that the average pitch of passerine birds' song is 4280 vibrations, or a quarter note higher than C_7, the highest note of the piano keyboard. This is about an octave and a half higher than the highest note that an operatic coloratura soprano can reach. The average of 4280 for fifty-nine species gives, I believe, a fairly correct estimation of all passerine song. However, there is great variation within the group. The average of Wood Warbler songs is considerably higher: for the sixteen species included in these studies, it was found to be 5350, or a shade higher than the E above the highest note on the piano keyboard. This is two notes higher than the average of passerine song. In the thrush group, of which the songs of six species were studied, the average was about 2890, which is a shade under the highest F sharp on the piano, or F sharp $_6$, approximately three notes lower than the average. Icterine song also is comparatively low, and we found in the six species studied, exactly the same, i.e., 2890, as in the Turdidae. Fringilline bird song on the whole is high, although it includes the Cardinal whose clear, whistling tune averages lower than one would presume. The Cardinal song is 2800, or a shade above the highest F (F_6) of the keyboard. The songs of thirteen fringilline species studied, showed an average of 4800 or just under D sharp $_7$, the D sharp above the highest note (C_7) of the keyboard.

The highest song studied was the Black-poll Warbler's. Its average note

was 8900 or over an octave above the highest note on the piano. It is midway between C sharp $_8$ and D_8. The Blackpoll also produced the highest avian frequency studied, 10,225, a note about a quarter under E_8. Other high averages were counted for birds in the following order: Grasshopper Sparrow, 8600; Cedar Waxwing, 8400; Blue-winged Warbler, 7675; Blackburnian Warbler, 7300; Black and White Warbler, 6900. The difference in frequency between the first three, Blackpoll, Grasshopper Sparrow and Cedar Waxwing, is only about a half a note, and is so small and the pitch so high, that an ear would have to be remarkably accurate to recognize the pitch difference.

COUNT OF PITCH OF PASSERINE BIRD SONGS

For further reference for those interested in the subject, the following table gives figures for all songs reported on in this paper. The birds are listed under their common names as given in the fourth edition of the A. O. U. 'Check-list,' grouped by families in systematic order.

	No. of songs studied	*Approximate mean*	*Highest note (about)*	*Lowest note (about)*
TYRANNIDAE				
Eastern Kingbird	1	6225	6225	5850
Eastern Phoebe	2	4300	5200	3300
Alder Flycatcher	3	3300	4750	1925
Little Flycatcher	1	3500	5125	2375
Eastern Wood Pewee	1	4125	4375	3650
Olive-sided Flycatcher	1	3100	3850	2375
CORVIDAE				
Eastern Crow	1	1500(?)	1650	1450
PARIDAE				
Black-capped Chickadee	1	3300	3700	3025
TROGLODYTIDAE				
Eastern House Wren	1	4100	7125	2050
Eastern Winter Wren	1	5000	8775	3300
Long-billed Marsh Wren	1	4400	5475	1925
MIMIDAE				
Catbird	1	3000	4375	1100
TURDIDAE				
Eastern Robin	1	2800	3300	2200
Wood Thrush	1	2750	4025	1825
Eastern Hermit Thrush	1	3000	4375	1475
Olive-backed Thrush	1	2925	3850	2000
Veery	1	3300	4750	2375
Eastern Bluebird	1	2550	3100	2200
BOMBYCILLIDAE				
Cedar Waxwing	1	8400	8950	7675

	No. of songs studied	*Approximate mean*	*Highest note (about)*	*Lowest note (about)*
STURNIDAE				
Starling	1	3475	8225	1100
VIREONIDAE				
White-eyed Vireo	1	2800	3825	1925
Yellow-throated Vireo	1	2750	3825	2325
Red-eyed Vireo	1	3600	5850	2375
COMPSOTHLYPIDAE				
Black and White Warbler	1	6900	8050	5300
Blue-winged Warbler	1	7675	8050	7125
Tennessee Warbler	1	6600	9150	4025
Eastern Yellow Warbler	1	5900	8775	3475
Black-throated Green Warbler	2	6025	6750	5125
Blackburnian Warbler	1	7300	8775	5475
Chestnut-sided Warbler	1	5125	8775	3100
Black-poll Warbler	4	8900	10225	8050
Northern Pine Warbler	1	4150	5125	3300
Oven-bird	2	4000	5850	3300
Northern Water-Thrush	1	2925	3850	2000
Louisiana Water-Thrush	1	4000	6600	2475
Mourning Warbler	1	3300	5125	2375
Yellow-breasted Chat	1	2600	4400	1275
Hooded Warbler	1	4000	5850	2925
American Redstart	1	6200	7300	4400
ICTERIDAE				
Bobolink	1	3000	6950	?
Eastern Meadowlark	1	4400	6025	3150
Western Meadowlark	1	2500	3475	1475
Yellow-headed Blackbird	3	2000	?	?
Eastern Red-wing	1	2925	4375	1450
Baltimore Oriole	1	2500	3825	2050
THRAUPIDAE				
Scarlet Tanager	1	2925	3625	2200
FRINGILLIDAE				
Eastern Cardinal	1	2800	4375	2200
Indigo Bunting	1	5700	8875	3250
Eastern Goldfinch	1	4100	7400	2750
Eastern Savannah Sparrow	1	5000	8775	3300
Eastern Grasshopper Sparrow	2	8600	9500	7675
Eastern Henslow's Sparrow	3	4200	6200	3425
Eastern Vesper Sparrow	2	4800	6600	2750
Slate-colored Junco	1	4750	5500	3850
Eastern Chipping Sparrow	3	5000	8400	3475
Western Chipping Sparrow	1	4000	5500	3300
Eastern Field Sparrow	1	4100	5100	3650
Swamp Sparrow	2	5250	7500	2925
Eastern Song Sparrow	4	4700	7700	1900

To summarize: I believe that these studies are sufficiently comprehensive to warrant the conclusion that passerine song averages above 4000 vibrations per second or around the highest note of the piano keyboard.

Laboratory of Ornithology
Cornell University, Ithaca, New York

TWO NEW BIRDS FROM THE CHISOS MOUNTAINS, TEXAS

BY HERBERT W. BRANDT

THE rich fauna of the Chisos Mountains still continues to furnish ornithological surprises. During a short trip to this region in central-western Texas, in the spring of 1937, it was the writer's good fortune to obtain specimens of two apparently new subspecies of birds, descriptions of which are herewith presented. The writer is indebted to Dr. Harry C. Oberholser for assistance in the preparation of these descriptions, and to the U. S. Biological Survey, to the Museum of Zoology of the University of Michigan, to Dr. Max M. Peet, and to Dr. George M. Sutton, for the use of comparative material.

Vireo huttoni carolinae subsp. nov.

CHISOS VIREO

Type.—Adult male, No. 2048, collection of Herbert W. Brandt; Boot Canyon, altitude 7000 feet, Chisos Mountains, Brewster County, Texas, May 10, 1937; Herbert W. Brandt.

Subspecific characters.—Similar to *Vireo huttoni stephensi* Brewster, from Arizona and southwestern New Mexico, but much darker above and rather darker below. Resembles *Vireo huttoni mexicanus* Ridgway, from southern and central Mexico, but averages smaller, the upper parts much more grayish (less olive greenish), and the lower parts lighter, less olive greenish (more grayish).

Measurements.—Adult male: wing, 63–69 (average, 66.7) mm.; tail, 48.5–55 (52.2); exposed culmen, 9.3–12 (9.9); tarsus, 18.5–20.5 (19.4); middle toe without claw, 9.3–10.5 (9.8).

Geographic distribution.—From the Chisos Mountains, Texas, south to southern Coahuila and southwestern Tamaulipas, Mexico.

Remarks.—Comparison of thirty-five specimens of this vireo, mostly from the Chisos Mountains, Brewster County, Texas, with adequate series of specimens from Arizona and Mexico, shows clearly that this bird differs sufficiently to warrant recognition in nomenclature. Birds from the Mexican States of Coahuila and Tamaulipas are slightly intermediate between this new race and *Vireo huttoni mexicanus* of central Mexico, but they are nevertheless decidedly nearer the present form. Birds from southwestern New Mexico are, however, referable to *Vireo huttoni stephensi*, of Arizona.

It is with great pleasure that I dedicate this new subspecies of one of the delightful inhabitants of the Chisos Mountains to my wife, Carrie McGregor Brandt, who has been my companion on many a field trip.

Sitta carolinensis oberholseri subsp. nov.

CHISOS NUTHATCH

Type.—Adult male, No. 2061, collection of Herbert W. Brandt; Boot Canyon, altitude 7000 feet, Chisos Mountains, Brewster County, Texas, May 11, 1937; Herbert W. Brandt.

Subspecific characters.—Similar to *Sitta carolinensis nelsoni* Mearns, of the Rocky Mountains of the United States, but with bill and wing both shorter; the upper parts darker; and the lower surface rather darker, more grayish (less purely white). Differs from *Sitta carolinensis mexicana* Nelson and Palmer, in having the wing shorter; the upper parts rather darker, more purely gray; and the lower surface much paler and brighter (less buffy, brownish, or grayish).

Measurements.—Adult male: wing, 85.5–91 (average, 88.1) mm.; tail, 44.5–48.5 (47.2); exposed culmen, 16.5–19 (17.9); tarsus, 17–19 (18.2); middle toe without claw, 13–14 (13.6).

Geographic distribution.—Chisos Mountains, Texas, south to southern Coahuila, Mexico.

Remarks.—Fourteen examples of this new race have been available for comparison with allied forms. Birds from Sierra Guadalupe in southern Coahuila, Mexico, are not typical, verging somewhat toward *Sitta carolinensis mexicana* in their paler upper surface and rather larger size, but they are decidedly nearer the Chisos Mountains bird. Specimens from the Davis Mountains, Texas, and southern New Mexico, are intermediate between *Sitta carolinensis oberholseri* and *Sitta carolinensis nelsoni*, but are nearer the latter.

I take the opportunity of inscribing this new nuthatch to Dr. Harry C. Oberholser, whose work on the birds of Texas is well known.

11945 Carlton Road
Cleveland, Ohio

GENERAL NOTES

Eastern Brown Pelican in North Dakota.—On August 6, 1937, a Brown Pelican was observed by Messrs. Merrill C. Hammond and Max S. Jensen. They reported seeing the bird twice that day in Deep River at the edge of the Lower Souris Refuge, in Bottineau County, North Dakota. Mr. Hammond and Mr. Jensen are employed by the U. S. Bureau of Biological Survey for biological work, principally nesting studies and cover mapping, and are both qualified observers of waterfowl. Later I observed the bird myself, in about the same place. I had the opportunity to study it at close range with the aid of a Bausch & Lomb 7 x 35 binocular. I could readily make out every detail, and from the dull grayish color of the gular pouch determined that it was the Eastern variety, *Pelecanus occidentalis occidentalis*. It seemed to prefer to be alone, and carefully avoided the company of the numerous White Pelicans present. So far as we are able to determine, this is the first record of a Brown Pelican in this State.—C. J. Henry, *U. S. Biological Survey, Washington, D. C.*

Double-crested Cormorant in Delaware.—On July 5, 1937, eight Double-crested Cormorants (*Phalacrocorax a. auritus*) flew over my head as I was walking through the marshes of Assawoman Bay, about a mile west of the Fenwick Island Lighthouse Bridge, in Delaware. Since Harrison F. Lewis ('The Natural History of the Double-crested Cormorant,' p. 17, 1929) gives no summer records for Delaware, I feel that this record is worth recording.—Robert C. McClanahan, *U. S. Biological Survey, Washington, D. C.*

Whistling Swan in New Hampshire.—On December 3, 1937, seven Whistling Swans (*Cygnus columbianus*) appeared at Hinsdale Pond in southwestern Cheshire County, New Hampshire, and settled in the open water. While they concentrated on this piece of water, they were reported as being seen several times on the Connecticut River not far distant to the west. They lingered at the pond until late afternoon of December 9. In the course of their stay their number was determined to consist of three adult birds—two males and a female—with four birds of the year. The reason for their continued presence at this pond for a period of six days was believed to be because the pond had recently been partly drained, thereby disclosing excellent feeding conditions to retain them there. Ice on the borders of the pond was sufficient to keep the hundreds of observers from gaining too close an approach. However, several persons were enabled to obtain some motion and still pictures of these rare birds. Game Protector Mr. Martin and Leeman R. Nelson kept account of the birds. The latter observed them on the center of the pond at 4 p. m. on the 9th, but at 4 o'clock the next morning they were absent, probably because the pond had completely frozen over during the night.—Lewis O. Shelley, *East Westmoreland, New Hampshire.*

Shoveller breeding in northern Alabama.—The Shoveller (*Spatula clypeata*) is, for the most part, a northern breeding duck, with occasional and usually local southern breeding areas. Thus Bent ('North American Wild Fowl,' part 1), after giving the northern breeding localities, lists: "Kansas (probably local); northwest New Mexico (Lake Buford); central Arizona (Mogollon Mountains) and southern California (Los Angeles Co.); rarely and locally in Texas (Bexar Co. and East Bernard) and perhaps in northern Mexico." Ganier does not give any records of its breeding in Tennessee, where it is a fairly common to rare transient and a winter

resident. No breeding record is mentioned by Howell ('Birds of Alabama') for Alabama; hence this note.

Wheeler Dam, located across the Lauderdale-Lawrence County line in northern Alabama, was completed and the water impounded early in 1937. This new reservoir is some 72 miles in length and has a shoreline of approximately 960 miles. Much of it is shallow water, affording excellent areas for ducks as proven during the spring migration of 1937, when thousands of ducks of many species frequented the area. The following records relate to the Shoveller during the 1937 spring-migration period on Wheeler:

April 14	100 seen	in flight
April 17	50 seen	feeding
April 21	24 seen	feeding
April 25	44 seen	feeding

This migration presence is not unexpected, but the fact that in May broods of young were seen, is distinctly unusual. On May 4, two broods of three or four day old Shovellers were seen; one brood consisted of nine young, the other of eleven. Both were feeding in very shallow water and were within one hundred yards of each other; the parents were in attendance. On May 8, another brood of six was seen in shallow water of a pond, but was not again located in the vicinity. Again, on July 17, two broods of Shovellers were seen in approximately the same location as the broods of May 4—northwest of Decatur, Alabama—and were approximately two-thirds grown. They are believed to be the same broods as seen on May 4, but now they numbered six and eight young each. At this time the young were growing flight feathers and were seen frequently exercising their wings. Thus we have at least one very early indication of the possible effect of this newly impounded reservoir on waterfowl.—A. R. Cahn and Paul Bryan, *Tennessee Valley Authority, Knoxville, Tennessee.*

Blue Duck or Mountain Duck.—When last in New Zealand in 1934, I had an opportunity to examine a live and healthy individual of this rare duck at a distance of a few yards. Its actions were quite unlike those of any other duck that I have seen in life but the most peculiar feature was the plane of the eyes. All other ducks observe you with one eye, the head held sideways. In the Blue Duck (*Hymenolaimus malacorhynchus*) the eyes were directed forward; when looking at you it turned its bill toward you, the yellow deep-set eyes staring at you from each side of the bill just as in a hawk or heron. The effect was most un-duck-like and with its hiding habits (the Maoris were said to drag them out from under rocks with hooks) created an impression that here was the most aberrant of all ducks. The species is not nearly extinct and its whole structure should be carefully investigated. Unfortunately the authorities in power in New Zealand absolutely discourage any scientific work that necessitates the taking of specimens.—Allan Brooks, *Okanagan Landing, British Columbia.*

Eclipse in ducks of the southern hemisphere.—In the London 'Field' for September 4, 1937, Mr. Richard Perry discusses the eclipse plumage in drakes. He says, "The phenomenon of eclipse is peculiar, or nearly so, to drakes breeding in the northern hemisphere. American and British ornithologists differ on this point: the former state that no drakes eclipse in the southern hemisphere, the latter that some do." Phillips, in his 'Natural History of the Ducks,' states in volume 1: "None of the males of South American or Australian ducks have an eclipse," but in

the subsequent volumes there is evidence that he may have modified this view later. The presence or absence of an eclipse in captive birds can hardly be taken as absolute evidence of what may happen in a wild state.

Some years ago Mr. E. Fitzgerald of Tirau, New Zealand, wrote to me that both the Australian Shoveller (*Spatula rhyncotis*) and the Brown Duck (*Elasmonetta chlorotis*), had a full eclipse and later, January 6, 1934, at Rotorua, North Island, he was able to show this to me. The shovellers were breeding in small ponds south of Rotorua Lake; my diary gives the record, "Australian Shovellers were in pairs, the males in eclipse or nearly so; the eclipse is darker than the female plumage, no trace of crescent on head or white spot on flanks." The birds were tame and were studied with good binoculars at close range.

The same day at the beautiful Hamurana Springs the New Zealand Scaup was seen in numbers and extremely tame; the birds were mostly sitting on the dense beds of water-weed in the clear, fast-flowing stream, looking like models of ducks in highly polished mahogany; the females were mostly incubating away from the stream but a number were with the males. These females plainly showed the little-known but constant character of the female nesting eclipse, the white face had been lost exactly as in nesting females of the Lesser Scaup (*Nyroca affinis*).

Considering how much we have yet to learn regarding the eclipse in our North American ducks it would be safe to assume that much more evidence is required before we deny the existence of an eclipse in the ducks of South America. The Chiloë Wigeon (*Mareca sibilatrix*) definitely has no eclipse but in this species the female has the same brilliant plumage as the male. Phillips mentions a male Cinnamon Teal from Peru in Lord Percy's collection which was in full eclipse. It may be that the eclipse stage is of shorter duration than in the northern hemisphere and so is more apt to be overlooked.—Allan Brooks, *Okanagan Landing, British Columbia.*

Broad-winged Hawk migration in Mississippi.—As hawk migrations in the southeastern States are seldom noted, a migration of Broad-winged Hawks (*Buteo p. platypterus*) on September 28, 1937, near Starkeville, Mississippi, is of interest. The flight was observed from about 7.45 to 8.30 a. m.; during this time ninety-one of these hawks were seen. The first birds appeared about seven miles east of Starkeville, and the flight continued westward along U. S. Highway 82, passing just north of the city. Soaring birds were moving at a speed varying from five to ten miles an hour, and birds in full flight attained a speed of about twenty miles an hour. These rates were checked by automobile speedometer, and the hawks timed were moving parallel to the highway. The largest group seen at any one time contained twenty-eight birds, and the average group numbered about six.—Robert C. McClanahan, *U. S. Biological Survey, Washington, D. C.*

Black Gyrfalcon in Wisconsin.—On December 26, 1936, the Milwaukee office of the Wisconsin Humane Society was notified that "a large hawk" with a freshly broken wing was flopping around in a city back-yard. The owner of the property had no idea how the bird got there. Mr. Lester Diedrich, the society's field man, recognized the bird as a gyrfalcon and donated it to the museum. It is in the gray plumage and became our catalogue No. 17611. It is a splendid large specimen and was in excellent physical condition. It had been helpless on the ground for but a short time because the primaries and tail feathers were in perfect condition. We think that the bird may have flown against a wire, possibly while in pursuit of a Domestic Pigeon.

Inasmuch as we had insufficient material for comparison, and on account of the

general confusion concerning the status of the gyrfalcons, the skin was sent to Dr. Alexander Wetmore for possible identification. Drs. Wetmore and Friedmann determined the bird to be *Falco rusticolus obsoletus*.—O. J. Gromme, *Milwaukee Public Museum, Milwaukee, Wisconsin.*

Greater Prairie Chicken in western Pennsylvania?—In the last edition of the A. O. U. 'Check-list' the Greater Prairie Chicken (*Tympanuchus cupido americanus*) is stated to have formerly reached western Pennsylvania. The only basis for this ascription, as I am advised by Mr. F. C. Lincoln, is the record cited by Wilson ('American Ornithology,' **3:** p. 117, 1811), that refers to a nest found "between the Pilot Knobs and Bairdstown." It has been assumed that "Bairdstown" in this case referred to the place still known by that name just west of Blairsville, Indiana County, Pennsylvania. In his account of the "Snow Owl," however, Wilson distinctly specifies "Bairdstown, in Kentucky," and a careful reading of his text on the "Pinnated Grouse" is perfectly consistent with this understanding. I submit, therefore, that there is no valid reason for accrediting the Greater Prairie Chicken to western Pennsylvania. It is highly improbable that it has ever occurred there at any time, for the primitive areas of open country were comparatively small and completely isolated from the prairie region farther west. The range of the Heath Hen must have been completely cut off from its western relative by this forest barrier of the Appalachian divide. Newspaper reports to the contrary notwithstanding, there appears to be no acceptable evidence for the occurrence of the Heath Hen anywhere in the western half of Pennsylvania.—W. E. Clyde Todd, *Carnegie Museum, Pittsburgh, Pennsylvania.*

Purple Gallinule in central Illinois.—On April 30, 1937, a Purple Gallinule (*Ionornis martinica*) flew through an open window in the main library of the University of Illinois at Urbana. It was captured and brought to the Illinois Natural History Survey, where entomologists inspected it for Mallophaga. Placed in the writer's hands it was taken to Dr. S. C. Kendeigh, banded, and released. This is, so far as known, the seventh record for the State of Illinois and the first for Champaign County.—Frank Bellrose and Lynn Hutchens, *University of Illinois, Urbana, Illinois.*

Hudsonian Curlew, White-faced Glossy Ibis and Black-bellied Plover in Oklahoma.—On May 18 and 19, 1937, considerable numbers of transient Hudsonian Curlews (*Phaeopus hudsonicus*) fed and rested along the Beaver River, and at a broad, shallow lake close by, three miles south of Gate, Beaver County, Oklahoma. On May 18, we counted a flock of twenty-one birds. From this flock two specimens, a female (Semple) and male (Sutton) were collected. Early in the morning on May 19, the same flock (nineteen birds) was seen again. But at nine o'clock a larger flock appeared high in air; the two flocks joined and we counted between fifty and sixty birds. Our two specimens are apparently the first for the State, since Mrs. Nice does not list the Hudsonian Curlew in her admirable 'Birds of Oklahoma' (Publ. Univ. of Oklahoma Biol. Surv., vol. 3, no. 1, 1931).

In the same region (at the lake, not along the river) we took also two male White-faced Glossy Ibises (*Plegadis guarauna*), the first an exceptionally handsome and fat individual (gonads measuring 23 by 11 mm.) on May 18 (Semple); the second, a slightly less colorful bird, also fat and with much enlarged gonads, on May 25 (Sutton). This species Mrs. Nice (loc. cit., p. 58) calls 'accidental,' listing a single specimen taken 'about 1897' near Dover, Kingfisher County.

On May 18 and 19, again in the same general region, but along the river and not

at the lake, we saw a flock of about thirty Black-bellied Plovers (*Squatarola squatarola*). The birds were exceedingly wary, and we did not collect a specimen. Early on the morning of the 19th the flock arose, circled once, and disappeared to the northward. Mrs. Nice (loc. cit., p. 88) calls the Black-bellied Plover a 'rare transient,' mentioning but one record for the State—a single bird seen near Gate, Beaver County, August 18, 1925.—JOHN B. SEMPLE, *Sewickley, Pennsylvania;* GEORGE MIKSCH SUTTON, *Cornell University, Ithaca, New York.*

Greater Yellow-legs swimming.—On November 15, 1937, while the guest of Mr. Joseph G. Rosengarten, Jr., at the Supawna Club, Salem, Salem County, New Jersey, for the purpose of some duck shooting in the marsh controlled by the Club, I made the following observation. In the middle of the day at high tide, I observed a Greater Yellow-legs (*Totanus melanoleucus*) through the blind, not more than eight to ten feet away from me. The bird, to my amazement, entered the water, swam out among the duck decoys, a distance of perhaps twenty to thirty feet, and then leisurely swam back to shore and flew away. A little later in the day, two Greater Yellow-legs were observed on the far side of the creek about forty to fifty yards from my blind. Both birds entered the water, swam across the creek, a distance of about twenty yards, came out on the far side and resumed their search for food. I understand that A. C. Bent has quoted J. T. Nichols to the effect that while he never saw the Lesser Yellow-legs swim, he had not infrequently seen the Greater Yellow-legs do so. There seem, however, to be but few observations of this action.—CHARLES M. B. CADWALADER, *Academy of Natural Sciences, Philadelphia, Pennsylvania.*

American Knot in Iowa.—The observations which make this record possible were made at Goose Lake, Hamilton County, Iowa. Goose Lake, a typical Wisconsin Drift marsh, is located one-half mile east of Jewell, Iowa. It is about eighty acres in area, largely grown up to marsh vegetation. Three hundred yards of shore line along the east margin of the marsh are kept open by the activity of cattle and domestic waterfowl. In addition, it is probable that shade from nearby trees contributes toward elimination of the usual sedge and cat-tail growth along a portion of its length. This open shore line forms an attractive feeding ground for many migrant shorebirds.

On September 6, 1937, the writer observed an American Knot, *Calidris canutus rufus* (Wilson), at the water's edge on this open beach. In a listless manner the bird was alternately feeding and looking about. It apparently preferred to keep its own company to that of eight Lesser Yellow-legs (*Totanus flavipes*), twelve Semipalmated Sandpipers (*Ereunetes pusillus*), three Least Sandpipers (*Pisobia minutilla*), and one Semipalmated Plover (*Charadrius semipalmatus*), that were feeding at another point along the shore. The Knot was seen again on September 8. This time, 'breast-deep,' it was attempting to accompany seven Lesser Yellow-legs in feeding. The Knot was noticeably more conspicuous by frequent bathing which seemed to be encouraged by its efforts to feed with the longer-legged birds. On September 10, the bird was collected by Dr. R. L. Roudabush of the Department of Zoology and Entomology at Iowa State College. The specimen proved to be a male. A museum skin was prepared and deposited in the Iowa State College collection. The measurements in inches are as follows: length, 9.56; wing, 6.50; wings extended, 20.00; tail, 2.31; tarsus, 1.50; and culmen, 1.38. Dr. Logan J. Bennett, Associate Biologist for the U. S. Biological Survey, and Dr. Geo. O. Hendrickson, Assistant Professor in the Department of Zoology and Entomology at Iowa State College, agree with the writer in recognizing the specimen as the American Knot.

DuMont (Univ. of Iowa Studies, p. 15, 1934) placed this bird in his hypothetical list and wrote: "It was listed by J. A. Allen, and John Krider stated that he had found it during May in Northern Iowa. It has occurred in all the states surrounding Iowa and might be collected here." The only recent sight record known to the writer is by Bennett (Iowa State College Journ. Sci., **9:** 609–616, 1934) who reported: "Dr. Paul L. Errington and the writer observed fourteen of these birds May 21 on the rocky shore of Lost Island Lake, Palo Alto County." None was recorded during intensive investigation of shorebird migration by Spawn (Iowa State College Journ. Sci., **9:** 617–624, 1935) in Clay and Palo Alto Counties during the fall of 1934 or by Scott and Sooter (Iowa State College Journ. Sci., **11:** 247–252, 1937) at Goose Lake, Hamilton County, during the fall of 1936.

On the basis of the specimen now contained in the Iowa State College collection it is recommended that the American Knot be removed from the hypothetical list and placed in the state list for Iowa.—Thomas G. Scott, *Iowa State College, Ames, Iowa.*

Red-backed Sandpiper at Harrisburg, Pennsylvania.—On May 17, 1937, on a mudflat in Wildwood Park Lake in Harrisburg, at a distance of about a hundred feet, with binocular glasses, I saw a Red-backed Sandpiper (*Pelidna alpina sakhalina*) with some Spotted and Least Sandpipers. It was feeding in about an inch of water, dipping its entire head beneath the surface. Its curved bill and black belly could be seen easily. This is the first recorded finding of the species in this district.—Harold B. Wood, M.D., *Harrisburg, Pennsylvania.*

Migration of Godwits at Westport, Washington.—In the early afternoon of July 18, 1935, I was observing the migration of shorebirds near the mouth of a small creek that empties into the harbor on the east side of Westport, Washington. About a quarter of a mile away, stretching out into the bay for half a mile or more, was a long sand spit, now turned into an island by the fulling tide. I had already observed here large flocks of Least, Western and Red-backed Sandpipers, Long-billed Dowitchers and several small flocks of Hudsonian Curlews, when a long dark shadow passed over me, and on glancing up I was astonished to see an irregular extended line of birds which I immediately recognized as Marbled Godwits (*Limosa fedoa*). The line was about two hundred yards long and I estimated the number of birds as between two and three hundred. Many alighted on the flooded flats but the majority made for the sand bar and came to rest among the Herring Gulls. Five birds alighted within thirty feet of me and immediately began probing in the soft mud with their long bills. I was still more astonished to see that these five were white-rumped, black-tailed Hudsonian Godwits (*Limosa haemastica*) and that the two species were migrating together. Later in the day I found sixteen more of the latter species feeding near the old Westport dock. The day was bright and sunny with a cool northwest wind. On the three following days (19th to 21st of July) the same conditions prevailed. On the 19th, a long line of some four hundred birds flying abreast, came in at about high tide, and breaking into smaller groups, settled, some on the flooded flats and more on the sand bar. It was a most spectacular sight. Fifty or more birds, close together, would hover over the sand bar, then all at once, with their long legs dangling and their wings fluttering would pour on to the sand. On the 21st, the numbers of birds were estimated as between a thousand and fifteen hundred. They behaved as on the previous days, some settling to feed, but most of them alighting to rest on the sand bar. On the 22nd of July only two small flocks of some twenty-five and thirty-five birds, respectively, came in; and on the 23d not a

single godwit appeared. The migration was over for the time, although early in September a few small flocks were again seen.

In 1936 and 1937, I watched the spring and autumn migrations of the godwits with great interest. The Hudsonian Godwits arrived fairly early,—the earliest birds were seen on April 6,—while the last left about the 24th, when they were nearly in full plumage. The first Marbled Godwits appeared about April 10, and were seen until about the end of that month. In the autumnal migrations of these two years only a few scattered flocks were noted in early September.—ADAM BALMER, *Westport, Washington.*

Avocet in South Carolina.—Records of only about eight individuals of the Avocet (*Recurvirostra americana*) from South Carolina have appeared in print since the time of Audubon, and it may therefore be of interest to record an additional sight record of a bird seen during the field trip on November 19, 1937, at the extreme northeastern end of Bull Island, Charleston County, South Carolina, following the annual meeting of the A. O. U. in Charleston. The bird was seen by a party of five observers and was first noticed by Dr. Clarence Cottam, who was able to call it near us. It walked slowly past at a distance of about fifty feet, giving everyone ample opportunity to observe the characteristic bill and winter plumage pattern, which cannot easily be confused with those of any other bird. Both Dr. Cottam and the writer are familiar with Avocets in the West, and are certain of the identity of the bird.—CLARENCE F. SMITH, *U. S. Biological Survey, Washington, D. C.*

A Skua in the Caribbean Sea.—In view of the little known concerning the occurrence of skuas in tropical waters (see Murphy, Robert Cushman, 'Oceanic Birds of South America,' pp. 138, 1007–1008, 1936), it is of interest to report one of these birds seen on November 26, 1937, from the steamer 'Caracas,' formerly of the Red D Line, and now of the Grace Line, as the ship was approaching Puerto Rico from the south. The bird appeared in early afternoon, and was around the vessel until dusk, several times passing within thirty yards of me as I rested in the sun on the top deck. I had many excellent views of it. At nine o'clock that evening the ship was within sight of the light on the southwestern point of Puerto Rico. As it was not practicable to collect the bird its racial identity is not known.—ALEXANDER WETMORE, *U. S. National Museum, Washington, D. C.*

Glaucous Gull in Illinois.—There are but two previous records of the Glaucous Gull (*Larus hyperboreus*) having been taken in Illinois, and it is regarded as a rare winter visitant in the Chicago region. Consequently, the writer while observing ducks on the Illinois River, April 11, 1936, near Ottawa, Illinois, was very much surprised to see a nearly pure-white individual fly ten feet overhead. The gull continued its slow flight up the river until out of sight. On returning two days later, it was observed resting on a small sand bar with a number of Herring Gulls. Upon procuring a boat and a shotgun the gull was pursued and finally collected. The bird, a male, proved upon dissection to be badly diseased: many trematodes were found in the small intestine, and the peritoneum was covered with a greenish mold, probably of the genus *Aspergillus.* Such a diseased condition might account for its occurrence so late in the season far from its normal range. It was made into a museum specimen by Dr. A. C. Twomey and will be deposited in the Chicago Academy of Sciences.—FRANK BELLROSE, *University of Illinois, Urbana, Illinois.*

Glaucous-winged Gull in Oklahoma.—Looking through the collection of mounted birds at the Northwestern State Teachers' College at Alva, Oklahoma,

recently, I encountered an adult specimen of gray-winged gull which I felt must be of a species not listed for Oklahoma. I wrote Professor T. C. Carter, head of the Department of Biology at the College, asking him to send the bird to me. This he courteously did, giving me an opportunity to identify it as a Glaucous-winged Gull (*Larus glaucescens* Neumann), probably a female. The specimen has but one wing, this measuring almost exactly 400 mm. The height of the bill at the base is 18.5 mm. According to Professor Carter the bird was taken near Capron, Woods County, Oklahoma (about fourteen miles north of Alva), on February 15, 1912. The Glaucous-winged Gull is not listed by Margaret Morse Nice in the revised edition of her 'Birds of Oklahoma' (1931).—George Miksch Sutton, *Cornell University, Ithaca, New York.*

Longevity of a Black-headed Gull.—In the review of Géroudet's paper in 'The Auk' for April, 1937, on the Black-headed Gull (*Larus ridibundus*) in Switzerland it is mentioned that longevity records for wild banded birds are now available of from six to ten years (one case). On June 13, 1910, I banded a chick of this species in a Cumberland gullery with ring No. 30870, which was recovered in the parent gullery on May 26, 1930, making the bird twenty years old. It was sitting dead on a nest and had not died of old age, but was egg-bound. This is, I think, the oldest banded bird so far recorded.—H. W. Robinson, *Lancaster, England.*

Bonaparte's Gull a summer resident in northern Indiana and the Chicago Region.—On June 13, 1937, I made a trip to Whiting, Indiana, the oil-refining metropolis, to look at the nests of several species of birds rare for this region, and at the same time to become better acquainted with a group of younger, but very zealous and efficient ornithologists there. They are Messrs. A. F. Wilson, H. M. Smith and Bob Saunders, who have been finding nests of the elusive Wilson's Phalarope, the Yellow-headed Blackbird, and even the Common Tern, as lately recorded in 'The Auk' by Dr. A. W. Butler, Mr. Perkins, and Captain Wolfe.

It is interesting to note that the first two species have never nested further east and south than this swampy region at the Indiana-Illinois state line, and they are still hanging on to a precarious existence where our destructive civilization is turning things upside down in an especially wholesale manner. We went to the phalarope's nest, with the male protesting our intrusion; the Yellow-head's nest was in water too deep to be negotiated by me on such a visit, and the nest of the Common Tern had for this year not been located. Harry Smith, however, reported that he had seen three flying about the day before in the general neighborhood where they had been nesting the last five or six years.

But what caused some surprise on my part was when they mentioned that there was a number of Bonaparte's Gulls (*Larus philadelphia*) in the vicinity. We promptly visited the spot. It was where the nest of the Common Tern was last year, where the Indiana-Illinois line runs into Lake Michigan, at the site of the large Edison Electric plant. We could see the gulls from a distance, because they had chosen the crest of one of the many large, long coal piles for a roosting place. There were about fifteen of them; five had the blue-black head of the adults, four had a grayish head, and the rest were in the juvenal plumage. They allowed us to approach to within thirty feet. Mr. Wilson states that they have been there regularly since 1929. Of course, they are non-breeders. Even then it comes in the nature of a shock to find birds in your neighborhood in summer that for some reason you have been associating with the latitude of Hudson and James Bay. They have, however, been found on the coast of New Jersey in summer before.—C. W. G. Eifrig, *River Forest, Illinois.*

Ivory Gull from Oba, Ontario.—The Royal Ontario Museum of Zoology recently received, in the flesh, an Ivory Gull (*Pagophila alba*) taken on December 12, 1937, at Cameron Lake near Oba, Ontario. Oba is situated in Algoma District on the Algoma Central Railway, about one hundred miles northeast of Lake Superior. The bird, a female in first-winter plumage, is now No. 28893 in the Museum's collection. Apparently it is one of two specimens extant from this province though three additional birds collected have been reported, namely: one mentioned by McIlwraith ('The Birds of Ontario,' first edition, p. 35) and two mentioned by Atkinson ('The Biological Review of Ontario,' vol. 1, no. 4, p. 95). The other specimen, taken at Toronto on December 25, about 1887 (Fleming, J. H., Auk, vol. 23, p. 442), is also in the Museum's collection.—L. L. Snyder, *Royal Ontario Museum of Zoology, Toronto, Ontario.*

Montana Horned Owl in Massachusetts.—As Mr. A. C. Bent was looking over the mounted collection of birds at the New England Museum of Natural History not long ago, he remarked that a specimen labelled Arctic Horned Owl (*Bubo virginianus subarcticus* Hoy), collected by C. J. Maynard at Waltham, Massachusetts, November 30, 1867, appeared too dark for that race. He suspected that it was the Montana Horned Owl (*Bubo virginianus occidentalis* Stone), a subspecies not recognized by the A. O. U. until the fourth edition of the 'Check-list.' Mr. Ludlow Griscom carefully examined the specimen, confirming Mr. Bent's opinion. This owl was first recorded by the late A. P. Morse in his 'Birds of Wellesley and vicinity' p. 23, 1897, and was subsequently referred by Brewster to *Bubo v. subarcticus* in 'Memoir.' of the Nuttall Ornithological Club, no. 4, p. 203, 1906, where its status is discussed at length. Forbush in his 'Birds of Massachusetts,' vol. 2, p. 229, 1927, again refers to it under the same name. The bird is now on exhibition under its proper label. It constitutes the first record of the subspecies for Massachusetts, the second for New England.—Miss Juliet Richardson, *New England Museum of Natural History, Boston, Mass.*

Great Gray Owl from New York State.—Since published records of the occurrence of the Great Gray Owl, *Scotiaptex n. nebulosa* (Forster), for New York State are few, the following note will afford a brief contribution to our knowledge of the bird. On November 12, 1937, Dr. Thomas Barbour, Director of the Museum of Comparative Zoology, Cambridge, Massachusetts, called at the New York State Museum and presented to the Museum a mounted specimen of a Great Gray Owl. Dr. Barbour reported that this owl had been shot by Mr. Harvey D. Crowninshield of Moody, New York, at Gull Pond near the northwest corner of Great Tupper Lake, St. Lawrence County, New York, in the autumn of 1919. It remained in Mr. Crowninshield's possession until his death in 1936. Some time later Dr. Barbour obtained the specimen from Mr. Crowninshield's brother. Although the data concerning the owl carry no reference to its sex, the bird appears to be an adult female. Its measurements are as follows: wing, 457 mm.; tail, 337; tarsus, 51; culmen, from cere, 33. The total length of this owl as mounted is 736 mm.; however, there is visible evidence that the skin was somewhat stretched in the process of mounting.

The specimen has been rehabilitated and partially remounted. It is now displayed in the exhibit series of birds at the New York State Museum (Cat. No. 5967).

Eaton ('Birds of New York,' Mem. N. Y. State Mus., **12:** pt. 2, 116, 1914), lists ten records of the Great Gray Owl for New York State and remarks that they were the only ones at his "disposal." The following localities are represented: Lewis, Oneida, Ontario, Rensselaer, Steuben, St. Lawrence and Suffolk Counties; also

"Adirondacks" and "New York State." The St. Lawrence County record cited by Eaton was originally published by William Dutcher (Auk, **12:** 181, 1895), and refers to three specimens of Great Gray Owl then in the collection of H. M. Davidson of Ogdensburg. Dutcher remarks that all three birds "had been shot in the county within a period of five years." More recently, reference to the occurrence of the Great Gray Owl in Franklin County, New York, is cited by W. DeW. Miller (Auk, **32:** 228, 1915), on authority of Dr. Wm. N. MacArtney of Fort Covington, Franklin County. The section of Miller's narration dealing with the record follows: "Dr. MacArtney states that during the winter the Snowy Owl is frequently observed, and occasionally the Hawk Owl, Barred Owl and Great Gray Owl."

So far as I am aware these remain the only published records for the Great Gray Owl in New York State. The specimen here recorded for the first time, therefore, supplements the data on this species for St. Lawrence County.—DAYTON STONER, *New York State Museum, Albany, New York.*

Albino Chimney Swift.—On September 7, 1937, I stood on the top of the Long Hollow Fire Tower in the 'Central Peninsula,' Union County, Tennessee. The tower is eleven miles due east of La Follette, Tennessee. About a dozen Chimney Swifts (*Chaetura pelagica*) were feeding nearby, and an albino was among them. I had ample opportunity to observe the bird as it flew about the tower, sometimes above me, sometimes below. At times it swept by at a distance of ten feet or less. The whole plumage was a dull white, probably soiled by soot and other agents. I could not be certain of the color of the irides but thought they were normal rather than the albino pink. The other members of the group seemed to recognize its anomalous condition, for they pursued it from time to time. No other bird received this attention. The flock rarely permitted the albino to remain unmolested during my half-hour of observation. At times the dives at the albino appeared to be very savage, and the attacked one escaped only by dodging.—LEONARD WING, *Norris, Tennessee.*

Hummingbird in a Pigeon Hawk's stomach.—While collecting birds for the Zoology Museum of the Louisiana State University, I shot a female Eastern Pigeon Hawk (*Falco columbarius columbarius*) on April 16, 1937, at Grand Isle, off the coast of Jefferson Parish, Louisiana. Upon examination of its stomach contents, I was surprised to find the identifiable remains of a Ruby-throated Hummingbird (*Archilochus colubris*). Later, on a visit to Washington, D. C., I discussed the matter with Mr. Clarence Cottam, Director of the Food Habits Division of the Bureau of Biological Survey. With his permission and the assistance of Mr. Robert McClanahan of the Food Habits offices, I went through the extensive records of that division and found that no species of hummingbird had ever heretofore been recorded from any bird stomach. Thinking this of unusual occurrence in the life history of the hummingbird as well as of the Pigeon Hawk, I record it herewith.—GEORGE H. LOWERY, JR., *Zoology Museum, Louisiana State University, Baton Rouge, Louisiana.*

Say's Phoebe in northern Indiana.—On April 4, 1937, during a field trip of the Chicago Ornithological Society to the Indiana Dunes, a small party including Mrs. Amy G. Baldwin, Dr. Alfred Lewy, and myself, observed a Say's Phoebe (*Sayornis saya saya*) near Wilson in Porter County. Although our movements caused the phoebe to take wing often, it kept to the tops of the trees along the edge of a moving dune, which shelters and slowly covers them. From the top of this dune, against a dark background, we were able to study the phoebe's colors; the cinnamon-buff

underparts, gray back, darker-gray head, black tail, and dusky, light gray-brown breast were all noted. On a few occasions, one of the observers was able to approach within fifteen feet of the bird, and all were equipped with eight- or higher-powered glasses. Its actions and notes were distinctly those of a flycatcher. In spite of a light rain, it darted after insects once or twice along the side of the dune. With a restlessness and much jerking of the tail similar to our own phoebe, it occasionally uttered a soft, plaintive *pee-oor*. Having observed the Eastern Phoebe earlier in the day, the larger size of the Say's Phoebe was very apparent to all of us. According to Amos W. Butler of Indianapolis, the above constitutes, within the limitations of sight, the first record of this accidental visitor for the State of Indiana.—FRANK A. PITELKA, *Lyons, Illinois.*

An abnormal Blue Jay primary.—On October 24, 1937, at Danby (about ten miles south of Ithaca), Tompkins County, New York, the senior author collected an adult female Blue Jay (*Cyanocitta cristata bromia* Oberholser), in which the seventh primary of the left wing is abnormal (Plate 10, upper figure). This primary has the general appearance of a rectrix, though it is not quite straight. In the folded wing its outer web strikingly protrudes, since the basal portion is not hidden by the primary covert. The inner web is normal both in color and in structure; but the outer altogether lacks the normal blue color, and is about 9 mm. wide for most of its length, whereas it is normally not over 3 mm. wide at the widest point. The outer web has, in fact, much the appearance of a worn inner web, being similarly white and lax at the base. The tip of the feather is worn, with about 4 mm. of the shaft and its barbs broken off. So far as we can determine, the corresponding primary covert is normal. The seventh primary of the right wing is perfectly normal. The bird was in excellent condition. Though not fat, it weighed 99.9 grams. Nothing abnormal about its behavior was noted. The specimen (GMS No. 7819) will be added to the Fuertes Memorial Collection of Birds at Cornell University.

We are grateful to Mr. Richard Weaver for the excellent photograph of the freshly killed specimen.—GEORGE M. SUTTON AND JOHN R. ARNOLD, *Laboratory of Ornithology, Cornell University, Ithaca, New York.*

Hermit Thrush, Swamp and Savannah Sparrows as summer residents in western Maryland.—It is probably not often that one is enabled to correct or supplement a local list he published thirty-three years earlier. Such is my privilege and pleasure now. In 1904, I wrote a list of 'Birds of Allegany and Garrett Counties, Western Maryland' (Auk, **21**: 234–250). In it I listed the Hermit Thrush (*Hylocichla guttata pallasii* = *faxoni*) as a summer resident without giving specific dates which would bear out that assertion. This for the simple reason that I had lost or misplaced the records or specimens which would have enabled me to do so. Lately I came across a box of ancient skins, one of which furnished the date I searched for so anxiously thirty-three years ago. It is an Eastern Hermit Thrush, female in worn plumage, taken July 22, 1903, on the top of Negro Mountain, near Accident, Garrett County. I well recall the occasion. There were about ten of these thrushes in that Canada-like spot on that mountain, probably two families. I think it has since been recorded from similar places in adjoining West Virginia.

Likewise, I had included the Swamp Sparrow (*Melospiza georgiana*), as a breeder without giving definite dates to warrant the assertion. At this late date I hasten to add them: June 22, 1920, five or more seen and heard in a slough at Oakland, Garrett County (just at the watershed between the Gulf and Atlantic drainage); July 3, 1920, I took three in a large, open swamp on top of Negro Mountain; July 23, 1928,

a few were noted in a similar high, open glade swamp near Accident, all in Garrett County.

The Savannah Sparrow (*Passerculus sandwichensis savanna*) was not given at all in that list. This species clearly has no use for wooded, mountainous regions. But on subsequent visits to this lovely section I found it as a summer resident, but only in the higher and then more-open, agricultural parts, near Accident. Dates are July 8 and 17, 1920.—C. W. G. Eifrig, *River Forest, Illinois.*

An unfortunate Pine Warbler.—On April 23, 1937, while Mr. John B. Semple and I were collecting birds in the northern part of McCurtain County, southeastern Oklahoma, we chanced to frighten from the ground a small, dun-colored bird which obviously was in a weakened condition. It flew uncertainly, alighted in a small pine, lost its grip, fluttered to the lower branches, and fell to the ground. Hurrying forward, we caught in our hands a female Pine Warbler, *Dendroica pinus* (Wilson), so helpless that we decided it best to kill it. Examining the specimen closely, we discovered that the right foot was almost completely encircled by a piece of pine bark, which refused to come loose and which, judging from its weathered appearance, had been detached from the tree for some time (Plate 10, lower figure). The bird was very thin and its plumage badly worn. Most of the feathers of the crown were missing. It is our belief that the unfortunate bird had caught its foot in the bark while searching for food, was held captive for some time, finally managed to break free from the tree, but was never thereafter, because of the considerable burden, able to get about normally.—George Miksch Sutton, *Laboratory of Ornithology, Cornell University, Ithaca, New York.*

A warbler wave of interest.—When the days during spring migration are clear, we seem to miss in Florida and Alabama many of the warblers that bring so much color and movement to the northern groves and gardens. Apparently these birds fly directly over us, perhaps pausing only when they reach the Appalachians or beyond. However, this year (1937) I am able to report a real warbler wave in Alabama during the first two days of May. Several days of rainy weather evidently caused the birds to settle for feeding and rest. Many species were abundant; the air was filled with warbler songs. The Cerulean, ordinarily an inhabitant of the tree-tops, had joined its relatives in seeking shelter in the lower branches, and with them, was "singing in the rain." During one hour in the early morning of May 1, on the TVA reservation at Florence, Alabama, twenty species of warblers were observed. The following day, along Short Creek, near Guntersville, twenty-five species were found in three hours. The schedule below will show something of their relative abundance (P = present; C = common):—

	Florence	Guntersville	Song
Black and White Warbler	C	C	X
Prothonotary Warbler	P	C	X
Worm-eating Warbler		4	X
Golden-winged Warbler	1	6	X
Blue-winged Warbler		1	
Tennessee Warbler	2	1	X
Nashville Warbler	2	1	X
Yellow Warbler	C	P	X
Magnolia Warbler	C	C	X
Cape May Warbler		C	X

SUTTON AND ARNOLD: AN ABNORMAL BLUE JAY PRIMARY

SUTTON: AN UNFORTUNATE PINE WARBLER

	Florence	Guntersville	Song
Black-throated Blue Warbler		2	
Myrtle Warbler	C	C	X
Black-throated Green Warbler	C	C	X
Cerulean Warbler		5	X
Blackburnian Warbler	2	4	X
Sycamore Warbler	1		X
Chestnut-sided Warbler	C	C	X
Bay-breasted Warbler	2	3	X
Black-poll Warbler	2	5	X
Western Palm Warbler	3		
Louisiana Water-Thrush		C	X
Kentucky Warbler	P	C	X
Yellow-throat	P	P	X
Yellow-breasted Chat		2	X
Hooded Warbler	C	C	X
Wilson's Warbler	1		
Canada Warbler		3	X
American Redstart	P	C	X

The Sycamore Warbler was observed carefully for several minutes at a distance of eight to ten feet, in perfect light, the bird having come close in response to 'squeaking.' This is a heretofore unreported species for Alabama, unless recorded since the publishing of Howell's 'Birds of Alabama.'

In 'Birds of Alabama,' the Nashville Warbler is also reported "very rare," there being but one record at that time for the State. There had also been but one previous record for the Wilson's Warbler, May 2, 1908. The Cape May Warbler is listed as "occurring irregularly as a migrant," "recorded by two local observers"; the Black-throated Blue as a "rare migrant"; while the Bay-breasted, Blackburnian, Canada Warblers were reported as "rather uncommon."—C. Russell Mason, *Sanford, Florida.*

Leconte's Sparrow in southern Ontario.—The 1931 A. O. U. 'Check-list' gives the occurrence of the Leconte's Sparrow (*Passerherbulus caudacutus*) in Ontario as "casual." This seems to be the case in regard to that part of the province lying north and west of Lake Superior. In southern Ontario, however, the only record of its occurrence is that of one taken at Toronto by George Pearce on May 5, 1897 (Auk, **14:** 411, 1897). With the above exception, the most easterly record appears to be that of a male of the year taken near Lake Manitowik, northern Algoma District, on August 24, 1928, by Fargo and Trautman (Canadian Field-Nat., **44:** 30–33, 1930).

The year 1937 marked the first time in forty years that the species has been reported and verified by specimens from southern Ontario. This year's invasion was first evidenced on May 14, 1937, when George North identified one at the Dundas Marsh, Hamilton. On May 27, 1937, J. M. Speirs and the writer watched a singing male in a field at Armour Heights, on the northern environs of Toronto. Further visits to this field on subsequent days revealed at least six males, in song. Although this colony was present throughout the summer, no evidence of breeding was obtained.

On June 28, 1937, R. D. Ussher and D. Ross discovered several of this species at the Holland River Marsh in King Township, York County.

On July 10, 1937, while investigating the north side of the Holland Marsh, near

Bradford, in Simcoe County, F. H. Emery and the writer found a colony of eight Leconte's Sparrows in an area of approximately five acres. A male and a female were collected. Upon dissection, the female was found to have an egg developed in the oviduct and almost ready for extrusion. This specimen has been given to the Royal Ontario Museum of Zoology. On July 11, two more Leconte's Sparrows were collected in the same locality and they proved to be females. Although a search was made, no nests were located. Further visits to this area by the writer produced the following sight records for this species: July 17, five; August 14, five; August 28, three; August 29, two; September 11, two. After the sparrows had stopped singing in the latter part of July, they became very shy and were extremely difficult to flush.

The section of the marsh where this colony was found was quite dry and was covered with a dense growth of marsh grasses and sedges, interspersed with small clumps of dwarf willows. The following plants were recognized: goldenrod, boneset, Joe-Pye weed, blue flag and pitcher plant. Also occupying this area were Short-billed Marsh Wrens (*Cistothorus stellaris*), Henslow's Sparrows (*Passerherbulus henslowi susurrans*), Bobolinks (*Dolichonyx oryzivorus*), and Yellow Rails (*Coturnicops noveboracensis*).

On September 8, 1937, F. Barratt succeeded in capturing an immature male Leconte's Sparrow on the south side of the Holland Marsh, in King Township.

On July 30, 1937, he saw three Leconte's Sparrows at Baden, in Waterloo County, to establish still another locality where they have occurred this year.

Taking into consideration the possibility of this sparrow being overlooked by observers, due to its elusive and timid nature, it is the writer's belief that its presence in southern Ontario is of quite recent origin.—O. E. Devitt, *Toronto, Ontario.*

Leconte's, Henslow's, and Nelson's Sparrows near Toronto, Ontario.—On May 27, 1937, Messrs. F. Banfield, V. Crich, D. Miller, P. Turner and the author saw a Leconte's Sparrow (*Passerherbulus caudacutus*) in a field situated about one mile west of the northern limits of Toronto. The field comprises lots 11 to 15, concession 2 west, York Township. The only previous record of Leconte's Sparrow in the Toronto region is a specimen in the Royal Ontario Museum of Zoology obtained on May 5, 1897, by the late George Pearce and so recorded by J. H. Ames in 'The Auk,' vol. 14, p. 411, 1897. This species was observed almost daily from the date of discovery until the end of June and at least six singing males were finally located on the field. This is apparently part of the general eastward extension of range of this species as reflected by numerous recent notes from Ohio.

On June 10, 1937, Mr. D. Miller and the author found a nest of Henslow's Sparrows (*Passerherbulus henslowi susurrans*) with five young. Its nest was found in the same field as were the Leconte's Sparrows mentioned above. The only previous local breeding record is a nest discovered by Mrs. Eleanor Thompson near Erindale on July 5, 1932, and recorded in the 'Canadian Field-Naturalist,' vol. 47, p. 58, 1933.

On September 28, 1936, Mr. F. H. Emery rediscovered the Nelson's Sparrow (*Ammospiza caudacuta nelsoni*) in the Toronto region. The last previous local record is of a female collected by S. L. Thompson on June 12, 1905. One, and sometimes two Nelson's Sparrows were observed at Sunnyside, Toronto, from September 28, 1936, to October 25, 1936. On May 29, 1937, Messrs. H. Barnett, F. Barratt, L. Boyd, F. Cook, and A. Lawrie saw a Nelson's Sparrow on the same field where the Leconte's Sparrows already mentioned were found. This bird was seen by several observers until June 4, 1937.—J. Murray Speirs, *University of Toronto, Toronto, Ontario.*

Notes from Arkansas.—Ward's Heron, *Ardea herodias wardi.*—One of this subspecies was observed on Lake Hamilton, July 29, 1936, and again on August 4. A pair of the birds was seen on the lake August 5, and a single one August 11. It has not previously been reported from Arkansas.

Piping Plover, *Charadrius melodus.*—A single individual of this species in juvenal plumage was collected on Lake Hamilton, August 30, 1936. This is an addition to the State list.

Semipalmated Plover, *Charadrius semipalmatus.*—Two were seen on Lake Hamilton, August 30, 1936. From this date to October 12, fifty-two were enumerated, the largest flight one of fifteen. This species has never been reported from this State.

Black-bellied Plover, *Squatarola squatarola.*—One was seen on Lake Hamilton, September 14; four on September 16; one, September 17; six on October 28; two, October 29; and three, November 1, 1936. Those observed during September were in adult breeding plumage. Specimens in both plumages were collected. This species is an addition to the State list.

Upland Plover, *Bartramia longicauda.*—Thirty of these plovers, including a flight of twenty-two, were seen on the lake from August 10 to September 5, 1936. At one time common in Arkansas, it has become very rare in this State.

Baird's Sandpiper, *Pisobia bairdi.*—On September 16, 1936, a single bird, feeding with four Pectoral Sandpipers, was collected on a beach of Lake Hamilton. This seems to be the first record for this State.

Red-backed Sandpiper, *Pelidna alpina sakhalina.*—A pair was seen on Lake Hamilton November 2, 1936, feeding with seven Least Sandpipers and on November 12, 1936, a pair was observed with three Killdeers. Specimens were collected. This species has not been reported from Arkansas.

Stilt Sandpiper, *Micropalama himantopus.*—On August 6 and again on September 2, 1936, single birds of this species were seen at Lake Hamilton and a specimen was collected. These are apparently the first records from this State.

Buff-breasted Sandpiper, *Tryngites subruficollis.*—The first observation was made August 8, 1936, when a solitary individual was seen on Lake Hamilton. From this date until September 13, a total of seventy-one of these birds was seen, the largest flock containing thirteen. This sandpiper, which frequents the grassy portions of the shores, has not been reported from Arkansas.

Sanderling, *Crocethia alba.*—Single birds were seen and collected on September 16 and October 29, 1936, at Lake Hamilton. There is no previous report from this State.

Wilson's Phalarope, *Steganopus tricolor.*—Another addition to the State list was made on August 27, 1936, when one of this species was observed on Lake Hamilton. Single birds were seen on September 10 and 11 also, and specimens collected.

Franklin's Gull, *Larus pipixcan.*—A flock of nine was seen September 29, 1936, resting on a bar in Lake Hamilton with seven Caspian Terns. A specimen, a female in juvenal plumage, was collected, and identified for me by Dr. H. C. Oberholser of the Biological Survey. This gull has never been reported from Arkansas.

Bonaparte's Gull, *Larus philadelphia.*—One was observed October 1, 1936; three, October 17; two, October 25; a flight of about sixty, October 31, and a single bird, November 7. Audubon shot one of these gulls on the Mississippi River near the mouth of the Arkansas, November 12, 1820, and one was seen near Helena.

Starling, *Sturnus vulgaris vulgaris.*—A flock of at least sixty Starlings was seen in a tree near the shore of Lake Hamilton on October 27, 1936. Specimens were obtained. The Starling has been reported from Fayetteville, DeWitt, Rogers and Fort Smith.

NORTHERN YELLOW-THROAT, *Geothlypis trichas brachidactyla*.—One was collected October 5, 1936. It was feeding near the top of a water oak with a group of Myrtle Warblers. The skin was identified by Dr. H. Friedmann of the U. S. National Museum. This species has never been reported from Arkansas.

MISSISSIPPI SONG SPARROW, *Melospiza melodia beata*.—The skins of two Song Sparrows from my collection were identified for me by Dr. Oberholser as *M. m. beata*. Both were collected near Lake Hamilton. This subspecies is a common winter resident throughout Missouri and a rare summer resident in northern Missouri but has not been reported from Arkansas or Louisiana.—WILLIAM H. DEADERICK, *36 Circle Drive, Hot Springs, Arkansas*.

Bird records from northern Coahuila.—In the summer of 1936, Ernest G. Marsh, Jr., was employed as a student technician for the National Park Service for the purpose of conducting a biological survey of the Coahuila region of the proposed Big Bend International Park. The period from July 2 to September 22 was spent in the Santa Rosa and Del Carmen Mountains lying northwest of Muzquiz, between that town and the 'Big Bend' of the Rio Grande. The forty-four specimens of birds obtained, have been deposited in the United States National Museum. So little collecting has been done in northern and northwestern Coahuila that it seems desirable to record the following notes. Comments are confined to birds apparently not previously recorded from that State or to specimens representing extensions of ranges.

Accipiter velox velox (Wilson).—Because of a paucity of breeding records for the Sharp-shinned Hawk in Mexico, the following notes may be of interest. On August 2, Marsh located a family group including three immature birds in the pine and Douglas-fir forest of upper Vivoras Canyon, Del Carmen Mountains, elevation 8500 feet. An immature male was collected. From the behavior of adults and young there was reason to believe that the young were still being fed or had been fed by the parents until very recently. The birds remained in the vicinity for several days. A nest located nearby may have been used by these hawks. Eight or ten adults were observed in early August in the northern Del Carmens.

Otus asio cineraceus (Ridgway).—On August 28, a pair of Screech Owls was observed in the Spanish oak, madrona and hackberry forest at the waterhole in Jardin del Sur, Chuperosa Canyon, northern Del Carmen Mountains. The elevation of this locality is approximately 6500 feet. The adult male was collected but its mate continued to remain in the neighborhood, and was seen as late as September 7. This subspecies has not been heretofore recorded from Coahuila.

Colaptes cafer nanus Griscom.—The very small, very pale flicker of northeastern Mexico has recently been described by Griscom (Bull. Mus. Comp. Zool., **75**: 381, 1934) from a small series of adult and nestling birds taken in San Luis Potosi and southern Tamaulipas. The breeding range of this subspecies is still incompletely known. Red-shafted Flickers are common in the pine and oak forests of the Del Carmen Mountains between 7000 and 8500 feet. An immature female, collected in the Sierra del Jardin, August 7, has been identified as *nanus*. No nests or nestling flickers were discovered on this late date although a hole in a dead pine west of Vivoras Canyon, used by a flicker as a resting place at night, may possibly have been an old nesting site. Apparently *nanus* is the breeding flicker of the Del Carmens. Van Tyne and Sutton (Univ. Mich. Mus. Zool. Misc. Publ., no. 37, p. 46, 1937) state that this subspecies is a rather uncommon breeding bird of the lowlands in the Big Bend region, Brewster County, Texas, northwest of the Del Carmens. The known breeding range of this form is thus extended considerably northwest of San Luis Potosi.

Psaltriparus melanotis lloydi Sennett.—Lloyd's Bush-tit was found to be common in the Del Carmens, occurring in flocks in the lower oak forests, elevation 7000 feet. This bush-tit was observed in August and the first half of September. A male was collected at El Jardin, September 5. We know of no previous records from Coahuila.

Setophaga picta picta Swainson.—A male Painted Redstart was collected on August 11 in oak and juniper forest at Vivoras Spring, Del Carmens, elevation 7000 feet. Two others were observed on August 25 in thick pine forest in Vivoras Canyon, at 9000 feet. These are the first records for northern Coahuila.

Pyrocephalus rubinus flammeus van Rossem.—The Vermilion Flycatcher of California and Arizona has recently been separated from the bird occurring farther east by van Rossem (Trans. San Diego Soc. Nat. Hist., **7**: 353, 1934). A male, taken near Santo Domingo, east of the Del Carmens, on July 24, has been identified as this subspecies. Vermilion Flycatchers are common summer inhabitants of the plains and valleys south of Santo Domingo, east of the Del Carmen escarpment and the Santa Rosa Mountains. Apparently *flammeus* occurs along the Mexican border at least as far east as northern Coahuila. This form has also been recorded in the Big Bend region of Texas by Van Tyne and Sutton (op. cit., pp. 54–55) who cite a number of breeding records for Brewster County.

Passerina ciris pallidior Mearns.—Painted Buntings are common summer residents of the foothills of the northern Del Carmens and occur on the plains, east of these and the Santa Rosa Mountains, between Conejo and Muzquiz. A male was taken on July 25 at Piedra Blanca and a female at Jardin del Sur, September 1. There appear to be no previous summer records for Coahuila.

Aimophila ruficeps boucardi (Sclater).—Rufous-crowned Sparrows were found on open hillsides and mesas up to the edge of the oak forest at 7000 feet. The climax vegetation of the habitat in which they occur consists of lechuguilla, maguey, screwbean, and sotol. A specimen, identified as *boucardi*, was collected August 22 on the mesa east of Chuperosa Canyon in the Del Carmens. This subspecies is a resident of Hidalgo, Puebla, Tamaulipas and southern Coahuila. Its presence in northern Coahuila, close to the United States border, has not been previously recorded.

Amphispiza bilineata grisea Nelson.—Black-throated Sparrows were common in the screwbean-maguey-sotol association of the Del Carmens between 5000 and 7000 feet and were observed on the plains near the Rio Grande and Chihuahua State line. A male, collected at Jardin del Sur, elevation 7000 feet, on September 1, has been identified as this subspecies, extending its range in Mexico some distance to the north of the central Mexican Plateau.

Junco phaeonotus palliatus Ridgway.—An adult male was collected from a group of three on August 14 in the pine and Douglas-fir association in Vivoras Canyon, elevation 8500 feet. Two were observed in oak and madrona forest in Chuperosa Canyon, August 22, elevation 7500 feet. Red-backed Juncos probably breed in the higher regions of the Del Carmen and Santa Rosa Mountains. The only other records for this form in Coahuila have been of birds taken in the southern part of that State.

The authors are indebted to Dr. Harry C. Oberholser, U. S. Biological Survey, for the identification of the above-mentioned specimens.—Ernest G. Marsh, Jr., *University of Texas, Austin, Texas*, and James O. Stevenson, *National Park Service, Washington, D. C.*

Four extra-limital records.—Texas Red-tailed Hawk, *Buteo jamaicensis fuertesi*, in California.—Skin Number A299, female, Brandt Collection, taken in

Rose Canyon, San Diego County, California, by Griffing Bancroft, Jr., March 23, 1929, is a typical bird of this newly described race. This identification is confirmed by Dr. Harry C. Oberholser, and appears to be the first record of this well-marked hawk for the State of California.

A FAR-SOUTHERN RECORD FOR *Falco subbuteo jugurtha*.—Skin Number A31, female, Brandt Collection, taken by D. Townsley at Rumani, Southern Rhodesia, is from the collection of Captain C. D. Priest. This North African Hobby has thighs the same color as its breast, and not rufous as in the European bird. The previous most southern record of this rare Hobby was one taken at Gambia on the west coast by W. P. Lowe, hence this appears to be the first record for South Africa.

Falco sparverius fernandensis IN CHILE.—In a collection of twelve *Falco sparverius cinnamominus* taken by Carlos S. Reed in the vicinity of Santiago, Chile, is one that is very much redder and richer colored throughout, marking it a typical example of the insular form that occurs on the Juan Fernandez Islands far off the coast. This skin is Number A105, male, Brandt Collection, taken June 12, 1932, by Mr. Reed. Thus it may be that the island form migrates to the mainland in winter although this is the first record of that bird on continental Chile.

Belonopterus chilensis cayennensis.—In 'The Auk,' vol. 53, p. 457, 1936, Mr. John A. Griswold, Jr., describes the first recorded occurrence of this bird in Panama, and the first record north of South America. The two birds described were taken on May 17, 1936. In the Brandt Collection is a female of the same species, Number C106, taken by H. Wedel at Port Obaldia, Republic of Panama, on August 27, 1934. This individual seems to be the first bird of this species collected north of South America although I have failed to record it until now.—HERBERT W. BRANDT, *Cleveland, Ohio.*

Audubon copper plates, additions and corrections.—The recent increased activity in Audubboniana is the justification for an extension of my remarks that appeared in an earlier issue of 'The Auk' (vol. 51, pp. 343–349, 1934) on the whereabouts of the copper plates for the elephant folio of the 'Birds of America' by J. J. Audubon. During the spring of 1937 the estate of John Barton Payne was settled and a copper plate, No. 297, of the Harlequin Duck, was purchased therefrom by the Attic Book Shop, of Washington, D. C., which disposed of it to John W. Garrett, of Baltimore, Maryland. This is one of the comparatively large plates, being the second plate in part 60. Unfortunately Mr. Payne's heirs have no information at all about the plate or its source.

Two of the plates recorded in the aforementioned article as missing are in the lounge of the New York Zoological Society in New York City. These two plates—99, Cow Bunting, Cow-pen Bird; and 112, Downy Woodpecker—formerly belonged to Miss Grace H. Dodge, of New York.

Through the death of Chester F. Tolles, plate No. 322, of the Red-headed Duck, has now passed into the possession of his daughter, Mrs. Mabelle Tolles Marvin, of Ansonia, Connecticut.

In my former list, plate No. 338, of the Bimaculated Duck, was inadvertently noted as being owned by Norline instead of Eveline W. Brainerd.

The present status of Audubon copper plates is that of fifty-two plates actually accounted for, thirty-one are deposited in public institutions and twenty are privately owned. There are in addition either seven or eight plates the present whereabouts of which is unknown but which are undoubtedly stored in some attic or basement.—PHOEBE KNAPPEN, *U. S. Biological Survey, Washington, D. C.*

RECENT LITERATURE

The new Audubon's 'Birds of America.'—At various times some of the figures from the great elephant-folio edition of Audubon's 'Birds of America' have been reproduced in smaller form as illustrations, but to bring out the entire series of his bird plates within the compass of a single volume of a size that may be consulted without the use of block and tackle, is an audacious undertaking indeed. Yet here it is and at a cost not prohibitive considering the expense of production, while coming as it does at the opportune moment when a wave of popular interest in Audubon and his work is at its height, this handsome book[1] will undoubtedly receive a warm welcome from the widening circle of his admirers.

The entire series of five hundred plates is here, beginning with the noble Wild Turkey cock and ending with Baird's Sparrow. In order to bring the work to a reasonable size, each of the larger plates of the original edition has been reduced to the size of the page, while the smaller subjects, such as warblers and sparrows of which a single life-size figure appears on the original plate, are here reproduced of nearly or quite the same size. The result is that while in the original set each bird is of natural size, in the present volume the scale varies according to the individual needs of each case. To reduce bulk, both sides of each leaf are utilized, while at the bottom of the page appear the original number of the plate and the title with, in addition, several lines of print giving a condensed statement of the range, distribution, habitat, identification, breeding and food. Following the series of plates the editor has added a useful brief history of the original and the octavo editions, together with a transcript of the legends accompanying each of the original set of plates. An index of the original and the current English names of the birds shown makes it possible to find any one of the species easily, since they are not arranged in the systematic sequence.

Inevitably there will be much comment on the comparative merits of this later-day reproduction of Audubon's work. The varying scale of the figures produces an effect different from that of the folio work, but this was preferable to a uniform reduction. It would have been better to have omitted the printed matter at the bottom of each plate for the work cannot be expected to serve as a manual or take the place of the many convenient handbooks now available, while the added lines of black type detract from the beauty of the plates and from their availability for framing as separate portraits. We notice that the plate of Hutchins's Goose has the Latin title of *Branta canadensis* only, instead of that of the original. Concerning the Townsend's Bunting of Plate 400, of which the text states that its source is not given and that it is "another of his unknown species," Dr. Stone calls the reviewer's attention to the fact that Audubon himself states that it was "discovered in the vicinity of Philadelphia, by Dr. Townsend, of that city" (Ornith. Biography, **2:** 183, 1835), actually near New Garden, Chester County, Pennsylvania, on May 11, 1833 (see Michener, Rept. U. S. Dept. Agric. for 1863, p. 303), and that the original specimen is still preserved in the U. S. National Museum. A careful comparison plate by plate with the original folio series shows that while some of them have been admirably reproduced, in many others the method of printing gives unsatisfactory results; the same color values are not attained, and in many cases faulty registry of the different printings causes a minute overlapping with resulting failure to reproduce

[1] Audubon, John James. The birds | of | America. | With an introduction and descriptive text | by William Vogt. 31.5 × 22.5 cm., New York, pp. i–xxvi, pls. 1–500, 1937; The Macmillan Co., 60 Fifth Ave. $12.50.

the original tones. To the process of reproduction may also be attributed the fact that many of the figures have lost in clearness and brilliancy, or in the outlines of the individual feathers. In spite of many such defects the volume is handsome and substantial, and will help to make the work of Audubon still further available to ornithologists. A reproduction of the Cruickshank portrait serves as a frontispiece while the excellent introduction by Mr. William Vogt supplies helpful suggestions for the general reader.

But the charm of Audubon's birds lies not alone in their beauty of line and color, nor in their spirited poses, but to a degree in their reflection of the artist's own dramatic personality, his ardor, his love of his subject, the difficulties under which he labored, the unflagging zeal with which he strove to accomplish the object he had set his heart upon. The elephant folio is symbolic of all these things; nothing smaller can ever quite measure up to the same standard. Nevertheless, the republication of the plates in the present form is a major event in the ornithological year, and in thus making Audubon's 'Birds' available to hundreds who might never see the originals, the editor and the publishers have conferred a favor upon the public, the difficulties incident to which must indeed have been great.—G. M. A.

Stegmann on the Falconiformes of the U. S. S. R.—This is a careful, detailed, and important contribution[1] to our knowledge of the hawks, eagles, falcons and their allies, occurring in Russia and Siberia. Extensive series of specimens were studied in most cases, and the results are therefore deserving of serious consideration. Stegmann follows current usage in recognizing two families: one for the falcons—Falconidae, and one for the buteonine and accipitrine hawks, the eagles, marsh hawks, ospreys, and vultures. This family he calls Aquilidae, although most authors today prefer the name Accipitridae, on grounds of page priority of the generic name *Accipiter* over *Aquila*.

We may limit ourselves in this notice to those points that bear most directly on North American forms. In the gyrfalcons Stegmann recognizes the race *F. rusticolus grebnitzkii* as the form of the Tschucktsche Peninsula, the Anadyr region, Kamchatka and the Commander Islands—the form that also occurs (although he does not say so) on the Bering Sea coast of Alaska. He restricts *F. r. uralensis* to northeastern Europe and northwestern Siberia. The reviewer has had occasion to study these birds and came to different conclusions, resulting in the "lumping" of *grebnitzkii* with *uralensis*, the former name going into synonymy. It is true that in the Commander Islands, whence *grebnitzkii* was described, a white phase occurs that is not found in western Siberia (*uralensis* of Stegmann). But the other phases of *grebnitzkii* and of *uralensis* are alike. The same sort of geographic variation in the presence or absence or relative abundance of one color phase or another is also true of *obsoletus* and *candicans*, which has led the reviewer to "lump" them also. The northern race of the Bald Eagle, for which Stegmann uses the name *washingtoniensis* Audubon, is considered as a subspecies of the Gray Sea Eagle, *Haliaeetus albicilla*, with no explanation (at least in the German summary). This is a systematic treatment contrary to the evidence afforded by the characters of the two birds, and one with which the reviewer does not agree. The American race of the Golden Eagle, *Aquila chrysaëtos canadensis*, is found to occur in the northeastern part of Siberia, the Anadyr region, the Indigirka and Java areas, and breeds in the vicinity of Jakutsk, but not farther south. The

[1] **Faune de l'USSR.** Sous la direction de S. A. Sernov, de l'Académie rédigé par A. A. Stackelberg. Oiseaux, vol. 1, no. 5. Falconiformes, par B. Stegmann. Moscow, Leningrad. pp. i–viii + 293, 15 pls., 102 text-figs., 1937. In Russian, with a French title page and a summary in German.

bird of the Yenissei and Kamchatka is the subspecies *kamtschatica*. Stegmann considers the Kamchatkan form of the Rough-legged Hawk, *Buteo lagopus kamtschatkensis*, as indistinguishable from the Turkestan, central-Siberian form, *B. l. pallidus*. Inasmuch as this involves the birds of the St. Michael's area in Alaska it is of importance to students of North American birds. It may be said, however, that with admittedly inferior series to study, the reviewer came to the opposite conclusion, and found *kamtschatkensis* a valid form, after he had already published a note on the Alaskan (St. Michael's) birds as *pallidus* (Condor, **36**: 246, 1934).—H. FRIEDMANN.

Shaw's 'Birds of Hopei Province.'—The issue from the press in Peiping, China, in December 1936, of the book[1] bearing the above title is noteworthy in the world of ornithology, not only in that it is a model of its kind but also because it is the first scientific monograph on birds to be prepared entirely by a Chinese scientist. In his foreword, Dr. A. W. Grabau disclaims ability to speak with authority on the subject matter of the book and says, "that will be duly evaluated by specialists in the same field." The writer of this present review does not claim to be a specialist in this field in the same sense that the author, Mr. Tsen-Hwang Shaw may properly be said to be, as his study of the birds of Hopei has been an avocation pursued while engaged in another profession. The same may be said, however, of leading writers on the birds of this province: Père David, Consul Robert Swinhoe and J. D. La Touche, all now unfortunately dead. Dr. Hugo Weigold and Mr. Shaw are now the only professional ornithologists who have treated the birds of this province. Since professional students of Hopei birds are so few, it may not be amiss for one who has observed them as opportunity offered for forty-three years to give his evaluation of the book.

The author's scientific connections are given on the title page as "Assistant Professor of Zoology, Fan Memorial Institute of Biology; Lecturer on Vertebrate Zoology, Tsing Hua University; Fellow, California Academy of Sciences; Fellow, Peiping Society of Natural History; etc." The large quarto volume of 974 pages, bound in two sections, with 506 illustrations in the text, 25 plates and a map, is the second volume in the vertebrate series of 'Zoologica Sinica,' the first having been prepared by Tchung-Ling Tchang, on cyprinoid fishes.

The plan of the work is to give for each of the birds described eight classes of information,—as comprehensive as the best works of the kind in other countries. These items are: 1) synonymy, not always complete but adequate; 2) Chinese names, local, classical, translated and newly suggested for the future; 3) English name; 4) description, using the standard terms well defined, Ridgway's 'Color Standards,' 1912, and Maerz and Paul's 'Dictionary of Colors,' but common color terms are used in the main; 5) body weights, taken in the field with distinctions of age and sex, a feature not often attempted by other writers in the past; 6) measurements, according to the accepted customs of American ornithologists among whom Mr. Shaw studied the science; 7) "habits and habitat," covering food, breeding and life history so far as known; and 8) distribution, covering both seasonal, geographical, vertical and horizontal. Dr. Alexander Wetmore's systematic classification, 1934, has been followed. The physiography, geology, climatology and botany of the province have been summed up more fully than one would think possible. The check-list of species recognized totals 416, and the number of forms described is 475. This includes about twenty of hypothetical occurrence. Cases of mistaken identification by other authors are usually indicated.

[1] Tsen-Hwang Shaw, A. M. The Birds of Hopei Province. 4, 974 pp., 506 illustrations in text, 25 plates and a map. December 1936: Fan Memorial Institute of Biology, Peiping, (Peking), China. Price $20.00, Chinese national currency.

Unique features which add to the interest of this book may be noted, as follows: 1) a list of Hopei birds occurring in classical literature, some fifty-three all told, but not all absolutely identifiable as to species; 2) a list of thirty-eight forms originally described from this province; 3) a correlation of the migrations of the birds with the twenty-four solar festivals which occur every two weeks throughout the year, by which the farmers are wont to characterize the times for their various agricultural operations; 4) a study of the life zones with the valuable suggestion that the isothermal line of 12 degrees Centigrade divides the northern from the southern life and that the northern mountain region corresponds to Dr. Merriam's transition zone in America, and the sea-level plain with the austral; 5) the ancient avifauna as revealed by the excavations at Chou Kou Tien, or "Chicken Bone Hill," where the government has so splendidly conducted the researches that resulted in the discovery of many remains of Peking man. The popular name of the hill suggests what has proved to be the case, that many of the bones found there are those of birds. Thigh bones of the Ostrich that laid the numerous fossil eggs found in several provinces have at last been discovered here. This résumé of the 'Introductory Part I, General Account,' is sufficient to show that the work has been done according to the best traditions of scientific ornithology of both Europe and America.

In the main portion of the book, 'Part II, Systematic Account,' we find many things of interest to the special student of this province, and some that are welcomed by ornithologists in many parts of the world. One piece of news to many of us is the practically certain rediscovery of David's Swan. This species was discovered by David in the Tientsin game market and named by Swinhoe. The original and only specimen in the South Cathedral, Peiping, having been lost or stolen, it has been an ornithological problem for many years, the solution of which is now announced in this book. While the bird has not been taken again in this province, its existence is proved by two young specimens, taken by an Italian expedition in Siberia, and one by a Russian, Tilippow, near Irkutsk, north of Hopei. Elise's Flycatcher, a valid species discovered by Dr. Weigold in the rapidly disappearing forest of the Eastern Tombs, and heretofore known only from that region, has been doubted as a dimorphism of the Tricolor Flycatcher. The collections of the Institute have given sufficient material to prove the validity of the species and also to extend its range into the forests of the Hsiao Wu T'ai Shan, in the western borders of the province. Until recently the occurrence of the very intriguing Pygmy Goose or Cotton Teal, in the lakes of Peiping, far north of its usual habitat on the Yangtze, had been resting on field-glass discovery by the present writer only. We are now pleased to find that the Institute has two specimens secured there in 1933.

On page 862 the author mentions without describing, David's Beautiful Finch as having been entered in the Chihli list by Wilder and Hubbard. He leaves it out of the described birds with the remark "that it is very unlucky that nothing has been recorded on this bird within the boundaries of this region," meaning the strict Hopei boundaries. Coming from this border forest we think the bird deserved a description.

The author's treatment of the Pied Jackdaw (*Coloeus dauuricus*) and the Black Jackdaw (*C. neglectus*) as two species is probably correct rather than as the dimorphism of one species, and agrees with the advice given us by the late C. W. Richmond and others. However, it still is an open problem among specialists. This book states that the black form is rather abundant as compared with the pied form which is the exact reverse of my own observations causing me to wonder if it can be a slip of the pen.

The collectors of the Institute show their great diligence, and are certainly to be

congratulated upon having found and photographed nest and eggs of the following very rare or very secretive breeding birds in this province: the Ruddy Crake, the Water Cock, Painted Snipe, North China Wren, Song Thrush, White-throated Thrush, Pallas's Blue Robin, Black-faced Bunting.

The Fan Memorial Institute of Biology and Mr. Shaw, may well be congratulated upon the appearance of this monograph. The illustrations, all in black and white, are profuse and well done with the meticulous care we are wont to find taken by Chinese artists.—GEORGE D. WILDER, *Penn Yan, N. Y.*

Hoffmann on German bird names.—This book[1] deals chiefly with folk names, the general history of which is briefly traced. The author then proceeds to discuss the origin and meaning of about 650 names, which he classifies in four groups: those suggested by perceptions of the human sense organs (subdivided into those derived from sounds the birds make, those that refer to appearance, color, and habits, those prompted by taste, smell, or feeling of birds or their products, and a miscellaneous group); bird names that have to do with myths and superstitions; misnomers; and names adopted from foreign languages. The section devoted to sound-names includes numerous musical and verbal notations of songs or calls. This useful work includes also a bibliography of sixty source writings, and a full index.—W. L. M.

Dr. Stone's 'Bird Studies at Old Cape May.'—To the ornithologists as to the gunners of past generations, the Cape May region of the New Jersey coast has been classic ground since the days of Alexander Wilson. Yet what would one not give for a clear picture of its bird life of a century ago! And lest future ranks of bird students deplore the same lack of detailed information in looking back on our own times, Dr. Stone has taken upon himself the task of providing in these two beautiful volumes[2] an account of the bird life of the New Jersey shores as he has known it, especially in the last two decades. He has endeavored to present here not so much "a mere tabulation of scientific data," as a "readable account of wild bird life" of the region; and in this he has admirably succeeded, drawing not only upon his own intensive observations carried on at all seasons for a score of years, but also upon other available sources, particularly upon the investigations of fellow members of the Delaware Valley Ornithological Club, to each of whom due acknowledgment is made.

The introductory chapters sketch briefly the aspects of bird life at Old Cape May, its onshore waters, its open country, towns and farmland, its salt marshes, coastal islands, and scattered areas of woodland. Of especial interest is the account of the "changing bird life of the Cape," wherein are garnered the scattered bits of information available from 1633 to more modern times in which human activities have continued to affect adversely many species of birds.

The phenomena of migration as witnessed at Cape May, Dr. Stone outlines from the ripe experience of many years' study, with much suggestive and valuable comment. The migrant land birds he regards as of two groups. The first includes those species that winter in our South Atlantic States or the West Indies, or which pass to South America by way of these islands. Such birds on passage normally travel along the Atlantic coast line. The second group comprises those species that winter in South America or southern Central America which they reach by crossing the Gulf of Mexico or skirting its shores. These migrants follow the Alleghany Mountains in

[1] Hoffmann, Bernhard. Vom Ursprung und Sinn deutscher Vogelnamen. 106 pp., Bernburg, 1937; Gustav Kunze. RM 4.

[2] Stone, Witmer. Bird Studies at Old | Cape May | an ornithology of | coastal New Jersey | Royal 8vo, vol. 1, pp. i–xv, 1–520, pls. 1–46 and frontispiece; vol. 2, pp. 521–941, pls. 47–119 and frontispiece; 270 text-figs., Delaware Valley Ornithological Club, at the Academy of Natural Sciences, Philadelphia. Price $6.50.

both northward and southward journeys. The migration of the two groups in relation to winds and to temperature is interestingly discussed and contrasted with the movements of shorebirds and other waterbirds which are apparently not governed by the same influences. Succeeding chapters are devoted to an analysis of the bird fauna month by month, with the added unusual feature of a listing of the species in accordance with their summer and winter homes. Of the total of 374 kinds of birds known from New Jersey, only fifty-six are not recorded from Cape May County itself, and these are included with an asterisk for the sake of completeness.

The main part of the work takes up species by species the birds of the State, with a narrative account of the characteristic occurrence and general habits of each as seen in the field, with occasional summary chapters such as those on the ducks, the autumnal hawk flights for which the region is noted, the Cape May shorebirds, and the warblers. Particularly interesting are the notes on the status of certain southern forms, the account of the breeding of the Black Skimmers, the visit of the Wood Ibises, the increase of the American Egret and other herons, the winter habits of Crows, the changes in the gull life, and numerous other points on which there is much of value. A short bibliography is added of works in which the reader, if he desires, may find detailed descriptions of the species here treated as well as the literature on New Jersey birds. A wealth of photographic illustrations, in one hundred and nineteen plates, adds much to the reader's understanding of the haunts and habits of many species while two colored frontispieces beautifully depict the Osprey and the Laughing Gull, respectively, familiar species of the region. These latter as well as many of the line drawings which illustrate in characteristic pose nearly every species, are the work of Earl L. Poole, while other figures are by Conrad Roland; a series of vignettes that serve to show various local features are by Herbert Brown and J. Fletcher Street; in addition the latter has contributed the maps of the region that appear on the inside of the covers. Here is another fine work on local ornithology to be placed on the shelf beside Forbush's 'Birds of Massachusetts' and Eaton's 'Birds of New York,' as a publication in which the author and its sponsor, the Delaware Valley Ornithological Club, may well take pride.—G. M. A.

Batchelder's 'Account of the Nuttall Ornithological Club.'—As the first organization in this country for the serious study of birds, the Nuttall Club has borne its part in the development of ornithology for more than three score years. A retrospect therefore becomes of value, that the later generations may know more intimately something of its earlier days, of the personality of its founders, and of the part they each played; what manner of men they were, and what light shone from their faces, revealing the spirit within. The Club may well count itself fortunate in having as its historian one, who almost from its inception has been a devoted member and an earnest champion of its highest ideals of thought and service. From rich memories of earlier days and associates, from manuscript records and from other sources he has prepared the present illuminating account[1] of its origin and development, and of the contribution of its members to the progress of ornithology, with much pertinent comment on the more intimate characteristics of each. Of especial worth is the series of photographs of its founders and many of its later members, taken so far as possible at about the time of their entrance into its membership. These, scattered as marginal insets through the pages of the memoir, give an intimate and personal touch such as little else could.

The beginnings of most important undertakings center about some great person-

[1] Batchelder, Charles Foster. 'An Account of the | Nuttall Ornithological Club | 1873 to 1919 |' Mem. Nuttall Ornith. Club, no. 8, 109 pp., text-figs., frontispiece, Dec. 1937.

ality whose dominant spirit attracts others and creates an impulse that may be handed on. Such was William Brewster whose enthusiastic interest in birds inspired his boyhood friends—Ruthven Deane, Henry Henshaw, Henry Purdie, W. E. D. Scott and others—and drew to them such men as Joel A. Allen, C. J. Maynard, Ernest Ingersoll, H. B. Bailey, J. A. Jeffries. Elected its first President in 1873, Brewster held this office—except for a single year—continuously until his death in 1919, where appropriately the record ends, as marking the close of an era in the Club's history.

With admirable skill the author recounts the circumstances leading to the formation of the Club in 1873, the various doings of some of its early members, the establishment of the Club's 'Bulletin' (the forerunner of 'The Auk'), and the activities of the succeeding years. He takes pains to correct a widespread impression that the American Ornithologists' Union was "in some fashion the offspring" of the Club, pointing out that its inception was a wholly separate and independent affair, although naturally the founders of the Union included some of the Club's more eminent members.

The concluding pages present a list of past officers and a brief biographical outline of each of the members, together with an index to the names of those mentioned in the text. It is fitting that as the frontispiece there is a portrait of William Brewster in the prime of his later years, an interesting contrast to the smaller text-figure showing him as a young man. Not least in point of interest also, is the cut showing the author himself at an earlier period. His history of the beginnings and later activities of the Club is of far more than local interest, of value to his fellow members; it is a real contribution to the history of ornithology in this country, inspiring us to look back from time to time for a perspective, that we in our day may judge if we are worthily carrying forward the torch handed us by those who went before.—G. M. A.

Bagg and Eliot's 'Birds of the Connecticut Valley.'—Somewhat of a new departure in 'local lists' is this large volume,[1] in which the authors present with great detail a record of the bird life of the Connecticut Valley in Massachusetts as observed in the course of constant field excursions over a period of years or gleaned from other sources. The preface outlines the scope of the work and defines the area covered as comprising mainly the three counties in western Massachusetts through which from north to south flows the Connecticut River for a distance of some fifty miles. The introductory chapter gives much interesting matter concerning local ornithologists from the time of J. A. Allen in the late 'fifties' to the present, with a detailed consideration of their contributions to local ornithology. Follows a chapter on identification and classification intended as a guide for the beginner with an essay on the Connecticut Valley as a highway for migration, and seasonal lists of birds to be found in the region.

The bulk of the book comprises the 'Systematic List' in which each of the three hundred or more species is treated in great detail, with first, the field marks, occurrence and dates, followed by a minute consideration of all available notes on its presence, and for rarer species a discussion of the possibility, probability or certainty of the various instances reported. Frequently the authors draw upon other published accounts for further illustration of the species in neighboring regions. With meticulous care they have searched every available source for information relating to the local occurrences of birds. Two appendices give additional last-moment observa-

[1] Bagg, Aaron Clark, and Eliot, Samuel Atkins, Jr. Birds of the Connecticut Valley in Massachusetts. 8vo, lxxiv + (20) + 813 pp., illustr., The Hampshire Bookshop, Northampton, Mass. $8.50.

tions as well as a list of the birds in the collection made by J. D. Whitney two generations or more ago, and now preserved in the museum of Yale University. In this collection, the most notable bird is a Wild Turkey, apparently the only extant specimen of New England origin. In their book the authors have with some apparent reluctance followed in the main the order of the 'Check-list,' with occasional deviations as where within certain families the species are rearranged "for the purpose of showing relationships other than anatomical" or in the coining of new vernacular names. For these and certain other personal preferences they admit that they may be liable to "censure." In addition to twenty-six half-tone plates from photographs of local interest, there are four black-and-white plates drawn by Roger Peterson and as frontispiece a Duck Hawk from the painting by Fuertes. The inside cover pages reproduce a map of the region.

In spite of much duplication of matter that has already appeared in print, and notwithstanding a certain exuberance of spirit with which the authors have enthusiastically sought to extend migration dates or to add unusual 'records,' there is much here of real value. They have presented abundant details regarding local distribution and habits that will be of increasing value as time passes and changes take place. One may find fault perhaps with too great a readiness to include many unusual 'sight records' which in spite of much inherent probability are of widely varying value, even though it be argued that much good field work must of necessity be limited to mere observation. For, in a region like western Massachusetts whose usual avifauna may be regarded as fairly well ascertained, the eagerness of the 'ornithoscopist' to add a 'record' or to extend by a few days his date limits of migration tends to overemphasize the abnormal without compensating deductions as to the general significance of such facts, while at the same time the more important phenomena of normal behavior are neglected.—G. M. A.

White's 'Birds at Concord, New Hampshire.'—Lying only some fifty miles north of historic Concord, Massachusetts, is Concord, New Hampshire, a long-settled area in the lower Merrimack valley, the bird life of which is here[1] reviewed. To his own ripe experience, covering some thirty years in the observation of the birds of the region, the author has added material derived from several good local collections as well as from certain other reliable observers, all of which is duly acknowledged. For each of the one hundred and ninety-four species included in the list, its general status about Concord is given, followed usually by a well-presented account of the characteristic local habits, the song and nesting, time and manner of migration, and locally favored haunts. Of unusual value are the notes regarding the comparative abundance of certain species and the changes in their habits and distribution during the past generation or longer, bringing out clearly the fact that the avifauna is not a static unit, but one the component parts of which are subject to gradual change when viewed in long perspective. Thus the Black-crowned Night Heron, though not yet detected as breeding, is now a regular summer visitor where once it was rare. Herring Gulls frequent the open river in increasing numbers, the Black Duck and the Wood Duck show on the whole a distinct improvement in their representation; while on the other hand the Red-tailed Hawk, once a breeding bird within the area, is now a rare transient only. Bob-white, here at the northern limit of its range, occurred in small numbers fifty years ago as a native species, where now it is represented by birds of recent plantings. The introduced Ring-necked Pheasant, for a time fairly abundant, has now greatly fallen off. Again, the Prairie Horned

[1] White, F[rancis] B. Local notes on the birds at Concord, New Hampshire. 8vo, 126 pp., map, The Rumford Press, Concord, N. H.

Lark has in the course of late years established itself as a nesting species, while others as the Wood Thrush, fluctuate in numbers from time to time. Shorebirds are less attracted to the region, but the Upland Plover still continues to breed there, and the Killdeer is now more often seen than formerly and even nests in the area. There are interesting notes on the former presence of the Passenger Pigeon gleaned in conversation with older residents of a past generation, its favorite stations, methods of capture, former abundance, and economic value. Accounts agree in placing the time of its last appearance in 1884 or 1885, when it had already reached a low ebb.

As a 'local list,' this is an exceptionally well-considered and well-written contribution that not only should prove helpful to those interested in the bird life of the region, but also cannot fail to be valuable in future as a contemporary record of present and recent conditions. Of convenient size and handsomely printed, it forms an attractive paper, concluding with an index to the species by serial number and a sketch map on which various important local features are shown.—G. M. A.

Parham's 'Nature Lover in British Columbia.'—A pioneer in the beautiful Okanagan Valley thirty odd years ago, the author here[1] recounts his experiences in establishing a ranch and fruit farm in what was then a sparsely settled region, to which he was drawn by sheer love of the outdoors, with its hardships and satisfactions, the grandeur of its scenery, the sweep of its open spaces, its lakes, rivers and wildlife. With an observant eye he soon learned to know the local flowers, birds and mammals, so that they became to him, and later to the members of his household like familiar friends. The brief winter, the coming of the spring, the busy summer and the waning autumn were yearly filled with seasonable activities through all of which the ever-changing aspects of Nature are here portrayed from a sympathetic viewpoint.

Various chapters are devoted to simply-told accounts of the ranch life—the clever dogs, the beauties of the scenery, the wild flowers, the many creatures. The birds especially come in for a large share of interest and there are chapters devoted to the seasonal changes in British Columbian bird life, with many brief notes of passing interest. The chapter on Canada Geese tells of hatching a brood from eggs incubated under a hen, and the mating two years later of one of the tame birds with a wild gander. The pair subsequently raised a brood in the dog's kennel on the back porch! These geese sometimes utilize old Osprey's nests high in dead trees in which to lay their eggs, but since the young are hatched and off at about the time that the Ospreys arrive, there is little interference, though one instance is mentioned of a goose incubating two Osprey's eggs in addition to its own. Lewis's Woodpecker proved to be an orchard pest, plundering the ripe apples. Formerly a few Trumpeter Swans wintered on Vaseux Lake but with the killing of a flock of seven in 1928–29, no more have been observed there.

In an appendix is given a carefully prepared list of British Columbian birds based on the author's observations and those of Major Brooks and H. S. Swarth, giving notes on occurrence and status, while in a table covering several pages are the Christmas Week censuses for the years 1926 to 1936. In a closing chapter the author makes a strong plea for the establishment of bird sanctuaries in British Columbia, and severely arraigns the Government's game officers for their laxity in enforcing protective measures. The book is embellished by a number of half-tone plates from photographs and from the sketches by Major Allan Brooks illustrating Clarke's Nutcracker and the Catbird. The occasional use of a small instead of a large initial in the generic name of various animals mentioned in the body of the work is an

[1] Parham, H. J. A Nature Lover in British Columbia. 8vo, London, 292 pp., illustr., 1937; H. & G. Witherby, Ltd., 326, High Holborn. Price 8 shillings 6 pence.

editorial slip that is corrected in the appendices in which the lists of plants, fishes, birds and mammals appear. Altogether this is an attractive little volume with much of homely interest and local value.—G. M. A.

Periodical Literature

Aaron, S. F. Speed awing. Scientific American, **93**, 283–285, Nov. 1937.—Measured the speed of birds flying over a "test mile": Reddish Egret 20 miles, Mallard 26 miles, Black Duck 30 miles, Blue-winged Teal 31.5 miles and Willet 36 miles per hour. Doubts the high speeds reported for some birds.—E. M.

Alexander, H. G. Kittiwakes as shore-birds. British Birds, **31**: 202–204, Dec. 1, 1937.—A large assemblage seen "settling day after day on a flat shore" at Sellafield, Cumberland.

Ali, Salim, and Humayun, Abdulali. The birds of Bombay and Salsette. Part II. Journ. Bombay Nat. Hist. Soc., **39**: 520–530, 3 pls., Sept. 25, 1937.—An excellent photograph illustrates the nest of a Tailor Bird in a sewn-up leaf; another shows a Black Drongo perched on the shoulder of a grazing cow, a common habit. The birds pick up the insects disturbed by the cow's feet.

Ali, Salim, and Whistler, Hugh. The ornithology of Travancore and Cochin. Part VIII. Journ. Bombay Nat. Hist. Soc., **39**: 569–593, Sept. 25, 1937.—Concluding part, embracing the sand grouse, pheasants and waterbirds, with notes on habits and occurrence.

Baillie, James L., and Harrington, Paul. The distribution of breeding birds in Ontario. Part II. Trans. Roy. Canadian Inst., **21**: pt. 2, 199–283, 1937.—Includes records for breeding species from Caprimulgidae through Fringillidae.

Banks, E. The distribution of Bornean birds. Sarawak Mus. Journ., **4**: 452–496, July 1937.—Comparison of fauna with neighboring areas, and by altitudes.

Banks, E. Birds from the highlands of Sarawak. Sarawak Mus. Journ., **4**: 497–518, map, July 1937.—Altitudinal distribution on mountains from 3000 feet upward.

Banks, E. Seasonal variation in the "white" edible birds' nests. Sarawak Mus. Journ., **4**: 519–522, July 1937.

Bannerman, David A. [A new race of the Brown-rumped Swallow.] Bull. British Ornith. Club, **58**: 8–9, Nov. 5, 1937.—Describes *Pseudohirundo griseopyga liberiae* from the Kru Coast of Liberia.

Bannerman, David A. [A new race of the South African sand martin.] Bull. British Ornith. Club, **58**: 31–32, Dec. 2, 1937.—*Riparia paludicola newtoni*, type from near Bamenda, British Cameroons.

Bates, G. L. [A new race of wheatear.] Bull. British Ornith. Club, **58**: 32, Dec. 2, 1937.—*Oenanthe lugubris boscaweni* from Tarim in Wadi Hadhramaut, Arabia.

Bennett, Logan J., and La Mar, Kate E. A marsh nesting colony of Black-crowned Night Herons. Iowa Bird Life, **7**: 44–46 2 text-figs., Dec. 1937.—Nesting activities of a colony in a marsh near Ruthven, Iowa.

Betts, F. N. Bird life on a southern Indian tank. Bombay Nat. Hist. Soc., **39**: 594–602, 2 pls., Sept. 25, 1937.

Boyd, A. W. American Pectoral Sandpiper in Cheshire. British Birds, **31**: 237–238, Dec. 1, 1937.—A Curlew Sandpiper and a Pectoral Sandpiper were feeding together on a small mere near Nantwich on September 13, 1937.

Brooks, Maurice. Evening Grosbeaks in Owen Sound, Ontario. Canadian Field-Nat., **51**: 109, Oct. 1937.—Suggests that birds occurring in southeastern Canada may arrive by way of the Owen Sound region.

Brouwer, G. A. Waarnemingen van broedvogels en trekvogels in 1936. I. Broed-

vogels 1936. Ardea, **26:** 52–68, May 1937.—Notes on breeding birds in Holland in 1936. Among others, forty-five pairs of the White Spoonbill nested on the Muy, Texel.

BROWN, GEORGE. Aggressive display of birds before a looking-glass. British Birds, **31:** 137–138, Oct. 1, 1938.—Actions of Pied Wagtail, Blackbird and Great Tit, all of which have more or less black in plumage.

BROCK, GWENDOLEN T. The morphology of the Ostrich chondrocranium. Proc. Zool. Soc. London, **107,** ser. B: 225–243, text-fig. 1–18, 1937.—A study of the cartilaginous skull in young embryos of the Ostrich reveals that it is in every respect typically avian, so that no support is lent to the contention of Lowe that the Ostrich is an early prevolant offshoot of the avian stem. Birds, from the chondrocranial evidence, "are easily traceable from reptilian stock, more especially the Crocodilia, as pointed out by de Beer." There are, however, one or two features that may be regarded as primitive, such as the large basitrabecular processes which are a persistent reptilian character, as well as the single-headed articular end of the quadrate. Typical avian characters are the lateral carotid foramen and the absence of any trace of an epipterygoid or ascending process of the quadrate.

BUSSMANN, J. Biologische Beobachtungen über die Entwicklung der Schleiereule. Arch. Suisses d'Ornith., **1:** 377–390, 4 plates, and other figures, 1937.—An excellent life-history study of the Barn Owl with particular emphasis on the development of the young. The number of feedings per night is usually five to fifteen, depending on other factors in addition to weather. The weight of the young reaches a maximum on about the thirtieth day and decreases during the development of the plumage. A second peak is reached about the fifty-second day followed by another falling off of the weight preceding fledging (sixtieth to sixty-sixth day). Barn Owls are curiously insensitive to changes in their nesting sites. Young birds that had been taken to an artificial nesting site several hundred feet away were not abandoned. Orientation of the bird in completely dark buildings was remarkable. Many details are given about the development and behavior of the young.—E. M.

CARTWRIGHT, B. W., SHORTT, T. M., AND HARRIS, R. D. Baird's Sparrow. Trans. Roy. Canadian Inst., **21:** pt. 2, 153–197, pl. 16, 1937.—A monographic study of range, breeding, plumages, and habits.

CHAPIN, JAMES P. A new warbler of the genus *Apalis* from the southern Kasai. Revue Zool. et Bot. Africaines, **29:** 393–394, Sept. 15, 1937.—Describes *Apalis schoutedeni*, a small grayish species from Tshikapa, in the southern Kasai district of the Belgian Congo.

CHAPIN, JAMES P. A new race of *Francolinus albogularis* from Marungu. Revue Zool. et Bot. Africaines, **29:** 395–396, Sept. 15, 1937.—This species is typically West African, but now is found in the highlands of the Marungu district, Belgian Congo, the most easterly record. The two specimens, now in the Congo Museum, are named in honor of the collector, *Francolinus albogularis dewittei*.

CHAPIN, JAMES P. The pipits of the Belgian Congo. Revue Zool. et Bot. Africaines, **29:** 336–345, June 15, 1937.—Eight species of *Anthus* are known from the Belgian Congo, and two others may be expected. A key to these is given. They are found in the grasslands or savanna woods, with the exception of *A. trivialis*, a migrant from the Palaearctic region, which may occur also in the open clearings in forests. Five new subspecies of African pipits are described: *A. richardi katangae* of the eastern Lulua district; *A. leucophrys marungensis*, type from Marungu; *A. pallidiventris*, from Eala, near Coquilhatville; *A. similis dewittei* from Kasiki, Marungu district; and *A. similis schoutedeni*, type from Kwamouth, middle Congo River.

COFFEY, BEN B. Swift banding at Memphis—sixth season. The Migrant, **8**: 70–72, Dec. 1937.—A few birds retaken at Memphis in autumnal migration were banded at localities farther north: Wisconsin, Iowa, Ohio. One other bird recovered had been banded six years before.

KNOWLTON, GEORGE F. Utah birds in the control of certain insect pests. Utah Acad. Sci., Arts and Letters, **14**: 159–166, 1937.—As a basis for this study, the writer examined 879 stomachs of birds of fifty-three species and concluded that they render a tremendous economic benefit to Utah agriculture, "compensating many times over for the moderate injury caused by a few of the species." Not only are the birds "decidedly helpful to the farmers" but they "substantially reduce injury upon large areas of range grazing land. . . ." The principal insect pests that are extensively fed upon by the various bird species include the beet leafhopper, false chinch bug, grasshoppers, Mormon crickets, stink bugs, alfalfa weevils, leaf bugs, and ants. A recent conspicuous example is given of the suppression, at Benson, Utah, by some 10,000 California Gulls of what would probably have been another serious grasshopper plague. Important and conspicuous as such examples are, it is probable that the greatest benefit derived from the feeding habits of birds is their incessant attack upon destructive insects thus by repressive action keeping them from developing into plague proportions.

The paper has much merit, yet to the reviewer it seems unfortunate that standard methods of stomach analysis were not employed in such an important and extensive study. Only numerical counts of major insect items seem to have been made. It is believed that the paper would have served a much greater purpose if the standard method of obtaining volumetric percentages of items had also been included. The fact that seeds and other plant items were rarely identified seems to indicate an unfortunate degree of superficiality in the laboratory analysis. It would seem that there is a moral obligation on the part of one who collects for economic studies as many as 124 Mountain Bluebirds, 77 American Pipits, 49 Audubon Warblers, 34 Western Meadowlarks, and 140 Chipping Sparrows, to mention only a few of the birds collected, to make as complete and thorough laboratory analyses as is reasonably possible. Indeed, every collected specimen should be used, if possible, to serve every available purpose. Considering the number of birds examined (879 stomachs) the paper seems much too brief and incomplete.—CLARENCE COTTAM.

DEVITT, O. E. The Arkansas Kingbird in southern Ontario. Canadian Field-Nat., **51**: 125, Nov. 1937.—A group of four, June 1, 1937, at the tip of Point Pelee, Lake Erie, and two others on June 11, near Hamilton, one of which stayed for over two weeks, mark an interesting invasion in early summer.

DOBZHANSKY, TH. Genetics and the origin of species. Columbia Biological Series, no. 11, 364 pp., 22 fig., 22 tables, 1937.—The often-heard criticism of the geneticist that he is only interested in the mechanism of the transmission of hereditary characters from parents to offspring but not in evolutionary problems, is no longer valid. Professor Dobzhansky has given us the much-needed survey of the particular field of genetics which relates to speciation and evolution. The problems revolving around mutations, selection, variability of population and isolating mechanism are discussed in the light of the most recent work. How active this field is, is best illustrated by the fact that more then ninety per cent of the papers quoted in the bibliography were published after 1920 and about half of them in the last five years. Literature on birds is quoted repeatedly, although the emphasis of the book lies on those animals and plants, genetics of which have been in-

vestigated experimentally. No taxonomist will be able in the future to speculate on the origin of species without first having seriously studied this fundamental treatise.—E. M.

DuMond, Frank L. An introduction to the birds of Michigan. 8vo, Michigan Audubon Soc., 35 pp., illustr., 1937.—A brief survey of various types of habitat in Michigan, followed by a table of the species of birds of the State arranged as permanent residents, summer residents, winter residents, summer visitants, migrants, and stragglers. There are blank columns for records and dates of such birds seen and a list of reference books.

Eates, K. R. A note on the distribution and nidification of the Northern Yellow-fronted Pied Woodpecker [*Leiopicus mahrattensis blanfordi* (Blyth)] in Sind. Journ. Bombay Nat. Hist. Soc., **39**: 628–631, Sept. 25, 1937.

Eates, K. R. The distribution and nidification of the Rock Horned Owl [*Bubo bubo bengalensis* (Frankl.)] in Sind. Journ. Bombay Nat. Hist. Soc., **39**: 631–633, Sept. 25, 1937.

Eates, K. R. Behaviour of Jerdon's Little Ringed Plover (*Charadrius dubius jerdoni* Legge) with young. Journ. Bombay Nat. Hist. Soc., **39**: 636–638, Sept. 25, 1937.—Describes 'injury feigning' on the part of both parent birds in an attempt to decoy the intruder away from their young.

Eggebrecht, Erich. Brutbiologie der Wasseramsel (*Cinclus cinclus aquaticus* (Bechst.)). Journ. f. Ornith., **85**: 636–676, Oct. 1937.—In this detailed study of the nesting habits of the Water Ouzel in Thuringen, Germany, it appears that the inner cup of the nest is made almost entirely by the female. Nest construction is done during only the first three or four hours of the daytime. The female works steadily, interrupting her labors an hour or so from time to time for feeding. In the nest observed, the first egg was laid on April 14, a day after the nest was finished; four eggs completed the set. The female alone performed the incubation, and the eggs hatched after fifteen days. Both parents fed the young but the female did about two-thirds of the labor. Both sexes sing, the male more frequently before feeding of the young began, and the female more often after this event. In diving the longest time spent under water was fifteen seconds. The young birds left the nest on the twenty-fourth day after hatching but stayed with the parents and were fed by them for over a month more.

Emlen, J. T., Jr. Bird damage to almonds in California. Condor, **39**: 192–197, text-fig. 55–57, Sept. 1937.—In central California, crows, jays, and California Woodpeckers may do much harm by knocking off and eating ripening almonds, the two former quickly learning to pick out the better varieties. "Since most California almond orchards are operated at a narrow margin of profit, a 5 per cent to 25 per cent loss, such as that described, . . . would often be sufficient to cancel all profit," but in large commercial orchards it is seldom so great.

Errington, Paul L., and McDonald, Malcolm. Conclusions as to the food habits of the Barred Owl in Iowa. Iowa Bird Life, **7**: 47–49, Dec. 1937.—A vast amount of predation may be of only neutral significance as in reducing excess population.

Fletcher, T. Bainbrigge. Birds and ants. Journ. Bombay Nat. Hist. Soc., **39**: 640, Sept. 25, 1937.—A Drongo was observed to fly down to the ground and for several minutes picked up ants one at a time, applied them to the root of its tail or beneath the wings, then swallowed them.

Franz, Jost. Beobachtungen über das Brutleben des Weissrückenspechtes. Beitr. z. Fortpflanzungsbiol. d. Vögel, **13**: 165–174, pl. 3, text-fig. 1, Sept. 1937.—The

male White-backed Woodpecker broods at night but both sexes took about an equal share in feeding the young. Details are given as to nesting activities.

GARTHWAITE, P. F., AND TICEHURST, C. B. Notes on some birds recorded from Burma. Journ. Bombay Nat. Hist. Soc., **39:** 552–560, map, Sept. 25, 1937.—Record of various rarer species.

GRANFIELD, WILLIAM M. Nesting of the Saw-whet Owl. Condor, **39:** 185–187, text-fig. 54, Sept. 1937.—Describes a nest of this owl found in San Mateo County, California. It was built in an artificial nest-box and contained on April 18, six creamy-white eggs, two of which on a later visit were found to be infertile. The figure, from a photograph, shows the juvenal plumage of the young bird, with the prominent white forehead. The feet clutch the perch with the second and third toes pointing forward, the two others backward.

GRANGE, WALLACE B. Feeding wildlife in winter. U. S. Dept. Agric., Farmers' Bull., no. 1783, 20 pp., Nov. 1937.

GRANT, C. H. B., AND MACKWORTH-PRAED, C. W. (1) On the status of *Caprimulgus clarus* Reichenow, and the races of *Scotornis climacurus* (Vieillot), in eastern Africa. (2) On *Caprimulgus nauta* Lönnberg. (3) On the type-locality of *Micropus affinis abessynicus* (Streubel). Bull. British Ornith. Club, **58:** 18–21, Nov. 5, 1937.

GRANT, C. H. B., AND MACKWORTH-PRAED, C. W. [Three notes on Caprimulgidae of Africa.] Bull. Brit. Ornith. Club, **58:** 32–35, Dec. 2, 1937.—Two races of *Caprimulgus europaeus* are admitted in East Africa, the typical form and the Indian *C. e. unwini;* critical notes on systematic status of other East African *Caprimulgus;* a female *Cosmetornis* and its two eggs are recorded from the top of Kahara Mt., Ushingo, western Tanganyika.

GRIFFEE, W. E. Effect of a late season on size of Prairie Falcon and Raven sets. The Oologist, **54:** 93–94, Aug. 1937.—The spring season in 1936 was rather early in eastern Oregon and sets of Prairie Falcon and Raven averaged larger than usual: four sets of the former consisted of five eggs each, and two were of six eggs each; four sets of Raven's eggs were of seven each and one was of eight. The spring of 1937, however, was about two weeks later than usual and completed sets of these birds were not only correspondingly late but contained fewer eggs. Of eleven sets of the falcon, only five were of five eggs each, while six consisted of but four each. Complete sets of Raven's eggs included only one of seven, three of six, two of five, and one of four.

GRINNELL, JOSEPH. The swallows at the Life Sciences Building. Condor, **39:** 206–210, Sept. 1937.—At this building of the University of California, completed in 1929, Cliff Swallows began nesting in 1935, making their nests in the squarish niches of the frieze that extends almost continuously around the four sides. In 1936, the colony numbered some 95 nesting pairs. They selected mainly the southeastern exposure, although structurally the four sides of the building are practically alike. This choice may have been influenced by the warmth in the early part of the day, or by the light factor, or by exposure toward mud and forage areas. The colony of swallows attracted a number of English Sparrows that utilized some of the swallows' nests.

GRINNELL, JOSEPH, AND BEHLE, W. H. A new race of Brown Towhee, from the Kern basin of California. Condor, **39:** 177–178, July 15, 1937.—New: *Pipilo fuscus kernensis* from Kelso Valley, Kern County, California.

HACHISUKA, MARQUESS. [On Edwards's painting of the Dodo.] Bull. British Ornith. Club, **58:** 16–18, Nov. 5, 1937.—In addition to the Dodo, this painting

shows a long-billed brown bird, which is now identified as the Flightless Land Rail of Mauritius, the third known representation of it, a bird which became extinct about 1759.

HAGAR, JOSEPH A. More hawks at Mt. Tom. Bull. Massachusetts Audubon Soc., **21**: 5–8, Oct. 1937.—Further notes on the autumnal hawk flights as witnessed from the lookout on Mt. Tom, western Massachusetts, in mid-September of 1937. On the 18th, the main flight passed, when over two thousand birds were counted, nearly all of which were Broad-winged Hawks with a scattering of eight other species.

HEILFURTH, FRITZ. Bemerkungen zu Griscoms "The distribution of bird life in Guatemala" an Hand meiner Balgsammlung aus Guatemala. Mitteil. a. d. Zool. Mus. Berlin, **22**: 230–238, 1937.—Notes based on further collections.

HENNESSY, T. S. Long distance flight of a banded Bluebird. Canadian Field-Nat., **51**: 109, Oct. 1937.—A bird banded as a nestling ten miles west of Ottawa was recovered near Lake City, northern Florida, in the following March.

HIBBERT-WARE, ALICE. Report of the Little Owl food inquiry. 1936–37. (Organized by the British Trust for Ornithology.) British Birds, **31**: 205–229, Dec. 1, 1937.—In the nesting months rodents and small birds predominated over insect food; of the latter, beetles were most commonly taken while moths and moth eggs were also a factor.

HOOGERWERF, A., AND SICCAMA, G. F. H. W. RENGERS HORA. De avifauna van Batavia en omstreken. Ardea, **26**: 1–51, pl. 1–7, map, May 1937.—The first part of a list of birds with annotations, in the vicinity of Batavia, Java.

JACOBS, J. WARREN. Forty years ago—and more. A list of nesting dates in southwestern Pennsylvania for 1893 and the six preceding years. Oologist, **54**: 134–138, Nov. 1937.

JOHNSON, R. A. The food of the Snowy Owl (*Nyctea nyctea*) during a migration to the Gulf of St. Lawrence. Canadian Field-Nat., **51**: 136–137, Dec. 1937.—In the 1933 incursion at Cape Whittle, the major part of pellets contained only mice; a few, remains of Dovekie, Black Guillemot, passerine birds and (in two pellets) rabbits.

KNOWLTON, GEORGE F. Biological control of the beet leafhopper in Utah. Utah Acad. Sci., Arts and Letters, **14**: 111–139, 1937.—The beet leafhopper, *Eutettix tenellus* (Baker), is a major agricultural pest in Utah. Fortunately there are a number of effective enemies that aid materially in its control. Outstanding among these are parasitic insects, birds, and lizards. Birds render the most conspicuous service during the fall migration when both the leafhoppers and the birds are most abundant. Western Chipping Sparrows, Rock Wrens, Shufeldt's Juncos, Gambel's Sparrows, Audubon's and Pileolated Warblers, American Pipits and Vesper, Brewer's and Lincoln's Sparrows were found to be the principal bird enemies. Of 713 birds collected, 195 had consumed 2,570 beet leafhoppers as a part of their last meal.—CLARENCE COTTAM.

KOOIMAN, J. G. Waarnemingen bij het nest van den Maleischen Slangenbuizerd (*Spilornis cheela bassa* (Forst.)) in Oost-Java. Ardea, **26**: 77–88, pl. 8–11, May 1937.—An excellent account of the habits of this snake-eating hawk in eastern Java, with photographs at close range of the nest with young at various stages, and the adult bird bringing snakes to feed to the single nestling.

KURODA, NAGAMICHI. An examination on the individual variations among 1,000 teals. Tori, Bull. Ornith. Soc. Japan, **9**: 273–299, 15 text-figs., June 1937.—This paper, in Japanese, illustrates some extremes of variation in details of the form of

the base of the bill, and in the amount of dark coloring of the chin, the details of spotting on the breast, flanks, tail coverts and under wing. There is a wide range in the amount of white in the greater wing coverts and in the half-collar on the neck. Unfortunately no résumé in English is given.

LACK, DAVID. The psychological factor in bird distribution. British Birds, **31**: 130–136, Oct. 1, 1937.—Birds keep to specific nesting sites, feeding habits and song perches and will rarely modify them.

LASKEY, AMELIA A. Notes on the song of immature birds. The Migrant, **8**: 67–68, Dec. 1937.—Describes early performances of Cardinal and Bronzed Grackle.

LEWIS, HARRISON F. Notes on birds of the Labrador peninsula in 1934 and 1935. Canadian Field-Nat., **51**: 99–105, Oct.; 119–123, Nov. 1937.—Further notes on the breeding Kittiwakes at Betchouane Bird Sanctuary; occurrence of Dowitcher near Seven Islands; first record of Blue-headed Vireo and of Cape May Warbler for the peninsula, both near Seven Islands; and of two Lark Sparrows, likewise the first for Labrador, at Aguanish.

LIVESEY, T. R. The egg-laying of the Khasia Hills Cuckoo (*Cuculus canorus bakeri* Hartert). Journ. Bombay Nat. Hist. Soc., **39**: 623–626, Sept. 25, 1937.—Describes the actions of the cuckoo in an unsuccessful attempt to lay an egg in a nest of the Burmese Stone Chat. The nest was too small to enter, but the cuckoo standing before it with wings and tail spread, assumed an upright posture and in a few seconds "jumped backwards with a sudden movement," and flew off, leaving her egg about three inches outside.

LIVESEY, T. R. Cuckoo incidents. Journ. Bombay Nat. Hist. Soc., **39**: 626–628, Sept. 25, 1937.—Comments on the preceding note.

LLOYD, HOYES. Twenty year old Ferruginous Rough-legged Hawk. Canadian Field-Nat., **51**: 137, Dec. 1937.—A bird provided with a collar, bell, and name plate at Clayton, New Mexico, in January 1917, was found dead in the spring of 1937 at Strongfield, Saskatchewan, where it was known to have nested for the last four or five years.

LOWTHER, E. H. N. Notes on some Indian birds. II.—Nightjars. Journ. Bombay Nat. Hist. Soc., **39**: 543–551, 5 pls., Sep. 25, 1937.—Nesting habits illustrated by several excellent photographs.

MACREYNOLDS, GEORGE. The birds of Bucks County, Pennsylvania, with annotations. Bucks County Hist. Soc. Papers, **7**: 1–63, 11 text-figs., 1937.—The first catalogue of the birds of Bucks County since that of Dr. Joseph Thomas in 1876. In addition to many brief notes of value, are comments on recent changes. The Ring-necked Pheasant was successfully established in 1915; Starlings first appeared in 1909. The Turkey Vulture has since 1915 become a regular breeding bird in the State. Barn Owls are increasing; Ruffed Grouse are decreasing in numbers. The effect of artificial lakes in increasing the numbers of waterfowl is well brought out.

MAILLIARD, JOSEPH. Hybridism between Myrtle and Audubon Warblers. Condor, **39**: 223–225, Sept. 1937.—Several supposed hybrids between these two birds are described. The criterion used is the occurrence of white edging or white patches on the fourth pair of rectrices in those referred to *D. coronata*, in which the white is usually confined to three pairs only. Since, however, this condition is occasionally indicated even in specimens from New York or Wisconsin, it seems doubtful if it necessarily is evidence of hybridism for white markings are especially likely to show wide variation in extent.

MANUEL, CANUTO G. Beneficial swiftlet and edible birds' nest industry in Bacuit,

Palawan. Philippine Journ. Sci., **62**: 379–390, 3 pls., March 1937.—The bird regarded as the true edible-nest builder of the region is *Collocalia francica germari*. It breeds in caves when the nests formed of salivary secretions are gathered by collectors who have, from time to time, operated under both written and unwritten laws. The nests vary in quality according to color, the fresh ones being white and the older ones darker. About 500 kilograms, comprising approximately 100,000 nests, are gathered in the Bacuit neighborhood annually. The collectors receive from 2 to 3.5 centavos per gram while the market price in Manila is from 7 to 9 centavos a gram. The industry is exploitive and attempts at regulation have not proved successful. The birds are holding up well, however, apparently due to inaccessibility of many of their breeding places. The illustrations include a map of the area concerned, photographs of the cliffs where the nesting caves are, and of the nests as collected and prepared for shipment. There is a bibliography of thirteen titles.—W. L. M.

MARCHLEWSKI, J. Guinea-fowl and common fowl hybrids obtained by means of artificial insemination. Bull. Int. Acad. Pol. Sci. Lettr., B2: 127–130, 1 pl., 1937.—Ten embryos (= 11%) developed in 89 eggs laid by guinea hens fertilized with white-leghorn sperma. None of the embryos, which had a mixture of the characters of both parents, survived hatching.—E. M.

MATHEWS, GREGORY M. [Notes on the genus *Fregetta*.] Bull. British Ornith. Club, **58**: 11–12, Nov. 5, 1937.—Claims that *Fregetta* Bonaparte is a misspelling of *Fregata*, and hence is preoccupied, a conclusion open to doubt. He advocates *Cymodroma* in its stead.

MATHEWS, GREGORY M. [Some overlooked generic names.] Bull. British Ornith. Club, **58**: 13, Nov. 5, 1937.—In 1834, S. D. Wood introduced the genus *Densirostra* for the Bullfinch. Two years later, C. T. Wood in the 'Ornithological Guide' proposed several other genera, and in the 'Analyst' of that year used *Sterna elegans*, preoccupying the same combination by Gambel, in 1848. The author proposes the name *Thalasseus ichla* for the bird described in volume 25, p. 84, 1896, of Sharpe's 'Catalogue.'

MCATEE, W. L. Local bird refuges. U. S. Dept. Agric., Farmers' Bull., no. 1644, 14 pp., 4 text-figs., Aug. 1937.

MCGILP, J. NEIL. Southern movements of northern birds. South Australian Ornithologist, **14**: 83–86, Oct. 1, 1937.—The appearance in the region of Adelaide, South Australia, of birds living usually more to the northward is believed to be a result of drought in the interior, as well as of the increase of artificial ponds in that region.

MEINERTZHAGEN, R. [A new snow-finch and a new *Sylvia*.] Bull. British Ornith. Club, **58**: 10, 1937.—Describes as new: *Montifringilla theresae* from Shibar Pass, Afghanistan, and *Sylvia nana theresae* from Sind.

MILLER, LOYE. Feather studies on the California Condor. Condor, **39**: 160–162, July 15, 1937.—Molting order of the primaries and secondaries.

MILLER, LOYE. Skeletal studies of the tropical hawk *Harpagus*. Condor, **39**: 219–221, Sept. 1937.—In its tarsometatarsus this hawk is close to *Accipiter* and far from *Falco;* the tibiotarsus is accipitrine except that its outer condyle is deeply cut away on the "proximo-anterior sector of its arc"; the coracoid is somewhat intermediate between those of *Falco* and *Accipiter*. The two corneous denticles on each side of the bill are better developed than is the single one of *Falco*. The author concurs with Peters in placing the genus close to *Accipiter*, which in its forest-living habits it likewise resembles.

MITCHELL, MARGARET H. Revision of birds of Miners Bay and vicinity, Haliburton County, Ontario. Canadian Field-Nat., **51**: 115–117, Nov. 1937.—Additions to previous list.

MOFFITT, JAMES. The White-cheeked Goose in California. Condor, **39**: 149–159, text-fig. 45–47, July 15, 1937.—A regular winter visitant to the northwest coast of California from late October to early April.

MOFFITT, JAMES. Waterfowl shooting losses indicated by banding returns. Trans. 21st Amer. Game Conference, New York, pp. 305–308, 1937.—In 1931 and 1932, a total of 119 Canada Geese were banded in California. Of these there were twenty-four returns, or 20 per cent after the 1933 shooting season. Of the 119 banded birds, twenty-three were adult and ninety-six were young of the year. Of these, only two adults were recovered (less than 9 per cent) against 23 per cent of young birds. Hence the adults have a greater chance for survival than the young. Since Lincoln has pointed out that the expected return from banded waterfowl in the following shooting season is approximately 12 per cent, and may aggregate 25 per cent within six years, the percentages for California geese are regarded as too large and should perhaps not exceed an average of 10 per cent.

MOORE, ROBERT T. New races of *Myadestes*, *Spizella* and *Turdus* from northwestern Mexico. Proc. Biol. Soc. Washington, **50**: 201–206, Nov. 30, 1937.—The new races are: *Myadestes townsendi calophonus*, *Spizella passerina atremaeus* and *Turdus assimilis calliphthongus*.

MUNRO, J. A. Studies of waterfowl in the Cariboo region, British Columbia. Condor, **39**: 163–173, text-fig. 48–49, July 15, 1937.—Loons sometimes kill the young of other waterfowl.

MURIE, OLAUS J. The birds of St. Lawrence Island, Alaska. Misc. Publ. Univ. of Alaska, U. S. Dept. Interior, **2**: 359–376, May 19, 1936.—Sixty-three species of birds are listed from this island in the northern part of Bering Sea. Of these birds, fifteen species had not previously been recorded from the island, while others already known, bring its total avifauna up to ninety forms. Among those added are the Sharp-tailed Sandpiper, Ivory Gull, Barn Swallow, European Wheatear.

OBERHOLSER, HARRY C. A revision of the Clapper Rails (*Rallus longirostris* Boddaert). Proc. U. S. Nat. Mus., **84**: 313–354, 1937.—From a study of Clapper Rails from all parts of their range, it appears that *Rallus longirostris* and other South American forms intergrade completely with *R. crepitans* of the eastern United States, so that the latter should stand as a subspecies of the former. In a review of the plumages, it was found that the bird in juvenal plumage retains its tail and wing feathers but renews the body feathers for the first winter plumage. Adults molt but once a year so that worn birds often look very dark when the pale edges of the feathers are gone. Individual variation in color is so great that five different phases are recognized: a light-gray phase, a dark-gray phase, a light-brown and a dark-brown, and a gray-breasted phase. In all, twenty-five geographic races of *R. longirostris* are recognized, ranging from northern Brazil and northwestern Peru to California and New England. Of these races the following are here first described: *R. l. pelodramus* of Trinidad, type from Caroni Swamp; *R. l. limnetis* of Puerto Rico, type from Punta Picua; *R. l. belizensis*, type from Ycacos, British Honduras.

PARMENTER, L. Notes on the courtship and mating of Smew and Goosander. British Birds, **31**: 151–153, Oct. 1, 1937.

PIERCE, WRIGHT M. A pet Sparrow Hawk. Condor, **39**: 137–143, text-fig. 40–43, July 15, 1937.

PUTZIG, P. Ueber den Zug nach Altersklassen bei der Saatkrähe (*Corvus frugilegus* L.) auf der Kurischen Nehrung. Der Vogelzug, **8**: 170–175, Oct. 1937.—The Rook does not usually breed until its second year. The earlier birds of the spring migration are adults.

RITTER, WILLIAM E. Mutually interpretive relation between human and avian natural history. Scientific Monthly, **45**: 524–531, Dec. 1937.—Discusses various parallelisms in activities.

ROBINSON, H. W. Nesting of Fulmar Petrel on the Bass Rock and incubation period. British Birds, **31**: 154, Oct. 1, 1937.—In 1936, the first nesting of Fulmars at Bass Rock was noted. In 1937, two pairs laid, but in one case the egg disappeared. In the other the chick hatched in forty-four days.

RODGERS, THOMAS L. Behavior of the Pine Siskin. Condor, **39**: 143–149, text-fig. 44, July 15, 1937.—Nesting and wintering habits at Berkeley, California.

RIX, C. E. In the fast dwindling mallee. South Australian Ornithologist, **14**: 86–91, Oct. 1, 1937.—An annotated list of birds seen in the scrub between Murray Bridge and Karoonda, South Australia.

SALOMONSEN, FINN. [Notes on the Philippine Paradise Flycatchers.] Bull. British Ornith. Club, **58**: 13–16, Nov. 5, 1937.—Regards them as generically inseparable from the eastern Asiatic mainland bird. The bird described by Gray in 1843 as *Tchitrea rufa* is renamed *Terpsiphone unirufa*, since the name is preoccupied by *T. rufa* Swainson, 1837.

SAUNDERS, W. E. City grouse. Canadian Field-Nat., **51**: 107–108, Oct. 1937.—Ruffed Grouse at Hamilton, Ontario.

SCHILDMACHER, H. Histologische Untersuchungen an Vogelhypophysen. 1. Die Zelltypen der Amsel, *Turdus merula* L. Journ. f. Ornith., **85**: 586–592, Oct. 1937.—In this preliminary paper are given the results of study of the structure of the hypophysis in the European Blackbird, from specimens taken between March and May, and from September to November. Three types of cells were made out, differing in their affinities for stains: 1) eosinophile cells, taking up eosin; 2) basophiles, forming the chief mass of the hypophysis and having a granular appearance, taking up anilin blue and azocarmine; and 3) chromophobic cells, especially numerous on the fore and hind ends of the gland, in which only the nucleus can usually be made out, and often a slight amount of colorless or faintly bluish plasma. Transitional stages between these types of cells occur. While the hypophysis of the female in both spring and autumn contains eosinophile cells, that of the male (with a single exception in the birds examined) contains this type in spring only. Alveoles are present in varying numbers containing basophile colloids.

SCHNEIDER, WOLFGANG. Beringungs-Ergebnisse an der mitteleuropäischen Schleiereule (*Tyto alba guttata* Brehm). Der Vogelzug, **8**: 159–170, Oct. 1937.—The tendency of the immature birds to emigrate sometimes in numbers, is brought out. Banded birds are recorded up to at least nine years of age.

SCHORGER, A. W. The great Wisconsin Passenger Pigeon nesting of 1871. Proc. Linn. Soc. New York, no. 48, p. 1–26, Oct. 1937.—From contemporary record in newspapers an account is given of a great nesting of these birds in central Wisconsin in 1871. The nesting area covered 850 square miles and an estimate is made of one hundred and thirty-six million nesting birds. Much valuable material is brought forward on movements.

SCHÜZ, E. Vom Heimzug des Weissen Storchs 1937. Der Vogelzug, **8**: 175–183, Oct. 1937.—In 1937, the White Storks appeared late and in diminished numbers

on their return to Europe from southern Africa. The author supposes that some disaster overtook the wintering birds, the nature of which remains to be explained.

SETH-SMITH, DAVID. [Albino Willow Warblers.] Bull. British Ornith. Club, **58:** 7–8, Nov. 5, 1937.—Two or three young from the same brood were white with a yellowish tinge, with deep-pink eyes and yellow legs. The one parent bird seen feeding them was, one infers, normal in coloration.

SHERRIFF, A. The Grey Sibia (*Sibia simillima*). Avicult. Mag., (5) **2:** 333–334, col. pl., Dec. 1937.—Imported from Sumatra.

SHILLINGER, J. E., AND MORLEY, L. C. Diseases of upland game birds. U. S. Dept. Agric., Farmers' Bull., no. 1781, 32 pp., 8 text-figs., Aug. 1937.

SHORTT, T. M., AND WALLER, SAM. The birds of the Lake St. Martin region, Manitoba. Contr. Roy. Ontario Mus. Zool., no. 10, 51 pp., 1 pl., 1937.—Lists 215 species with brief annotation.

SMITH, C. F., AND HOPKINS, C. L. Notes on the Barn Owls of the San Francisco Bay region. Condor, **39:** 189–191, Sept. 1937.—Where no buildings were available, these owls were found nesting in cavities formed by the weathering of earth banks. Nest-boxes placed in barns or trees near the haunts of these birds were in every case promptly occupied. In one hundred pellets analyzed, the California meadow mouse formed the predominant element, with the pocket gopher next, and other rodents in smaller numbers, while the Jerusalem cricket was a regular article of diet. Remains of birds were relatively few.

SNYDER, L. L., AND SPEIRS, J. M. On the status of the Starling (*Sturnus vulgaris*) at Toronto. Canadian Field-Nat., **51:** 124, Nov. 1937.—In March, the numbers increase due to return of migrants, as established by banding records. In May, the numbers decline but during summer rise to enormous proportions as flocking continues. They are least numerous in November. In 1929, a saturation point was reached, resulting in the occupation of all available nesting sites. Some evidence is seen of a three-year period in population fluctuation.

STECHOW, JAN. Notizen zur Brutbiologie des Grossen Buntspechtes. Beitr. z. Fortpflanzungsbiol. d. Vögel, **13:** 189–191, Sept. 1937.—Notes and drumming of the Greater Spotted Woodpecker.

STEINBACHER, JOACHIM. Anatomische Untersuchungen über die systematische Stellung der Galbulidae und Bucconidae. Arch. f. Naturgesch., sect. B, new ser., **6:** 417–515, 31 text-figs., 1937.—The anatomical considerations set forth bring the author to the conclusion that these two American families are more closely related to each other than are the barbets to the woodpeckers.

STEINFATT, OTTO. Beobachtungen über das Brutleben des Waldlaubsängers in der Rominter Heide. Beitr. z. Fortpflanzungsbiol. d. Vögel, **13:** 182–189, Sept. 1937.—Nesting habits and behavior of young of *Phylloscopus sibilatrix* in Germany.

STEINFATT, OTTO. Das Brutleben des Karmingimpels. Beitr. z. Fortpflanzungsbiol. d. Vögel, **13:** 210–223, Nov. 1937.—A detailed study of the nesting of *Carpodacus erythrinus* in eastern Germany. The incubation period is twelve days.

STONER, EMERSON A. Sleeping posture of a Virginia Rail. Condor, **39:** 227, text-fig. 62, Sept. 1937.—A Virginia Rail caught alive near Benicia, California, was allowed its liberty in the writer's home, where it seemed active and well. At evening it perched on a log by the fireplace and went to sleep with its feathers fluffed out into a round ball, and its head tucked under its right wing instead of among the scapular feathers. This position was verified several times and appears in the accompanying photograph. When disturbed the bird withdrew its head but presently resumed its position with head under the right wing. It was found dead the next day.

STRESEMANN, ERWIN. Kritische Studien über die Gattung *Batrachostomus*. Mitteil. a. d. Zool. Mus. Berlin, **22**: 304–329, 1937.—Ten species recognized. New forms are: *Batrachostomus hodgsoni indochinae, B. javensis chaseni, B. j. continentalis.*

STUPKA, ARTHUR. Pine Siskins in the Great Smokies. The Migrant, **8**: 69–70, Dec. 1937.—Abundance in 1937 possibly correlated with an unusually heavy seed crop of conifers.

SWENK, MYRON H. A study of the distribution and migration of the Great Horned Owls in the Missouri Valley region. Nebraska Bird Review, **5**: 79–105, Oct. 1937.—Five races of this bird occur in the region covered and a key to these is given, and their nomenclatorial history is briefly reviewed. The Eastern Great Horned Owl is the race breeding from Minnesota (except the northwest corner), and eastern South Dakota, across Iowa and Missouri to eastern Nebraska and eastern Kansas. The Western Great Horned Owl is the breeding bird over most of North Dakota (except the Red River Valley), western South Dakota and western Nebraska to northern Kansas. There is a slight easterly shift in population of this race after the breeding season. The Arctic Horned Owl occurs regularly in winter in North Dakota and Minnesota, between the last of October and February or March, while the Northwestern Horned Owl is a less regular winter visitor for which there are some eight records for Nebraska, while for the Pallid Horned Owl there are two Nebraska records, both in early December.

TAVISTOCK, LORD. Breeding results for 1937. Avicult. Mag., (5) **2**: 334–350, Dec. 1937.—Notes on raising pheasants and parrots of less common varieties.

THOMAS, J. F. Food of nestling swallows. British Birds, **31**: 234–235, Dec. 1, 1937.—The Common Swallow (*Hirundo rustica*) was found to feed its young largely on Diptera, especially *Dilophus*, and other genera in smaller numbers.

TODD, W. E. CLYDE. New South American birds. Annals Carnegie Mus., **25**: 243–255, Nov. 16, 1937.—New forms are: *Hydropsalis climacocerca pallidior*, and *H. c. intercedens, Electron platyrhynchum orientale, Phaëthornis superciliosus insignis, Monasa nigrifrons canescens, Nonnula rubecula simplex, Piculus chrysochloros guianensis, P. c. laemostictus*, and *P. c. hypochryseus, Tripsurus rubrifrons, T. cruentatus extensus, Celeus grammicus subcervinus, C. g. undulatus, Satrapa icterophrys septentrionalis, Todirostrum latirostre difficile, Polioptila paraënsis.*

VAN DOBBEN, W. H. Waarnemingen van broedvogels an trekvogels in 1936. II. Trekvogels 1936. Ardea, **26**: 68–76, May 1937.—Brief notes on the migrations of 1936 in Holland.

VAN ROSSEM, A. J., AND MARQUESS HACHISUKA. A new Bat Falcon from Sonora. Proc. Biol. Soc. Washington, **50**: 107–108, Aug. 7, 1937.—A pair of these falcons was found breeding in an inaccessible site in the cliffs overlooking the valley of Guirocoba, Sonora. The birds prove to represent a pale northwestern race, which is named *Falco albigularis petrophilus.*

VAN ROSSEM, A. J., AND MARQUESS HACHISUKA. The Blue-gray Gnatcatcher of southern Sonora. Proc. Biol. Soc. Washington, **50**: 109–110, Aug. 7, 1937.—The Blue-gray Gnatcatcher of the Sierra Madre in extreme southeastern Sonora is a well-marked race, having a paler and more ashy-blue coloration than the race *amoenissima*, its nearest neighbor, and with the black on the forehead reduced in summer males to a mere trace. It is named *Polioptila caerulea gracilis*, type from Rancho Santa Barbara, twenty miles northeast of Guirocoba, Sonora.

VAN ROSSEM, A. J., AND MARQUESS HACHISUKA. A northwestern race of the Mexican Black Hawk. Trans. San Diego Soc. Nat. Hist., **8**: 361–362, June 15, 1937.—The new race is *Buteogallus anthracinus micronyx*, type from Arivaipa Creek, Graham County, Arizona.

VOGT, WILLIAM. Thirst on the land; a plea for water conservation for the benefit of man and wild life. Circ. National Assn. of Audubon Socs., no. 32, 32 pp., 1937.—A timely plea for greater forethought in undertakings involving the drainage of swamps and marshlands. These areas are important in the maintenance of water levels and water tables. They help to prevent shrinking and subsidence of soil and act as effective reservoirs in retaining water and letting it seep away slowly. In critical areas, even a slight lessening of the available water may render the country uninhabitable, and this condition may proceed to even total absence of life. Much valuable material is here assembled of a definite sort, as in the comparison of the invertebrate fauna of an unditched marsh with one thus drained. Drainage resulted in the great reduction or even total destruction of bivalves, snails, crustaceans and insects, thus reducing the available supply of food for various species of important animals. A drained salt marsh, ditched for mosquito control, in six months contained only one-seventh of the animal life it supported when untouched. Much unnecessary drainage under the pretense of malaria control results not only in the loss of much money but in actual increase of the trouble. The report concludes with a series of useful recommendations urging that no drainage project be undertaken without a due consideration of the conditions and probable results.

VON HAGEN, V. WOLFGANG. The first royal birds of the Aztecs raised in captivity. Illustr. London News, **101:** 990–993, 1026, 1028, text-figs., Dec. 4, 1937.—Three pages of photographs illustrate the haunts, nest hole, and several young of the Quetzal taken in Spanish Honduras. The young were carefully reared from the time when they were ready to fly, and were safely brought to London. The author notes that during the season of heavy rains, from October to February, the birds move down from the upper levels where they breed, to the lower altitudes where there is less precipitation.

WAHBY, ALY. Recherches sur les poids du coeur, de l'encéphale et du gésier par rapport à celui du corps, chez quelques oiseaux. Alauda, (3) **9:** 143–150, 1937.—For fifty-four species of European birds, the comparative weights of the heart, the brain and the gizzard are given, each in fractional form in relation to the weight of the body plucked of its feathers. Among these, the heart in *Carduelis cannabina* is about one forty-first and in *C. spinus* about one forty-eighth of the body weight, whereas in *Phylloscopus collybita*, a bird of approximately the same size, it is only about half as large. The heart in the Common Swallow and the Swift, *Apus melba*, is again relatively smaller than in the two finches mentioned, perhaps indicating a less laborious method of flight. In the turkey and in the partridge, *Alectoris graeca*, the heart is relatively four or five times as small. The encephalon is much greater in proportion to body weight in many small birds than in such large species as duck, Herring Gull, cormorant, or heron. Variations in relative weights of gizzard compared to that of the body are not analyzed. In the list of species studied, brief notes on stomach contents are given.

WEEL, P. B. VON. Zur Histophysiologie des Pankreas vom Reiher (*Ardea cinerea*). Zeitschr. f. Zellforschung, **27:** 65–80, 7 figs., 1937.—The change in the cell element of the pancreas of the Gray Heron is described. The histophysiological processes during digestion resemble closely those of the mouse which have been studied previously by other authors.—E. M.

WENDLAND, VICTOR. Beobachtungen über den Seeadler. Beitr. z. Fortpflanzungsbiol. d. Vögel, **13:** 175–182, Sept. 1937.—Notes on pairing, nesting and hunting area of the Sea Eagle. Though preying largely on the Coot, their attacks are not always successful.

WENDLAND, VICTOR. Beobachtungen über den Seeadler. Beitr. z. Fortpflanzungsbiol. d. Vögel, **13**: 224–227, Nov. 1937.—Conclusion of paper on the Sea Eagle, its flight, distribution in Germany, and dangers to which it is exposed.

WETMORE, ALEXANDER. Bird remains from cave deposits on Great Exuma Island in the Bahamas. Bull. Mus. Comp. Zool., **80**: 425–441, 16 text-figs., 1 pl., Oct. 1937.—Of thirteen species represented, the following are new: *Calohierax quadratus* and *Titanohierax gloveralleni*, both new extinct genera and species of hawks, the latter a very large form related to the Urubitinga; *Tyto pollens*, a new species of large Barn Owl, now extinct, and represented by a related form from Haitian caves.

WETMORE, ALEXANDER. Observations on the birds of West Virginia. Proc. U. S. Nat. Mus., **84**: 401–441, 1937.—A review of specimens collected in the State indicates that a considerable northern tinge is present in the avifauna of the higher parts. The Canadian Ruffed Grouse (*Bonasa unbellus togata*) is found to extend southward through the mountains as far as Georgia; the Flicker is represented by the northern race; the recently described race, *caurinus*, of the Red-headed Woodpecker is upheld, and an average difference of five per cent in the wing length is found; the Barn Swallow is regarded as a race of *Hirundo rustica;* the Blue Jay is the northern form; the Southern Crow ranges from the central part of the State southward; the Black-capped Chickadee though slightly smaller and with a slightly darker back than northern birds is not as yet certainly made out a separable race; the resident Brown Creeper represents the race *nigrescens;* of the Robin, the birds of the eastern part of the State are in general typical *migratorius* while those of the lower country in the central and western parts are *achrusterus;* unexpected was the capture on May 11, of a typical male Giant Redwing (*Agelaius p. arctolegus*), evidently a migrant.

WHARTON-TIGAR, N. London Zoo notes. Avicultural Mag., (5) **2**: 358–360, Dec. 1937.—Notes on breeding of pheasants.

WHISTLER, HUGH. [*Perdicula argoondah meinertzhageni* subsp. nov.] Bull. British Ornith. Club, **58**: 9, Nov. 5, 1937.—Type from Nasirabad, Rajputana.

WHISTLER, HUGH. The Vernay Scientific Survey of the Eastern Ghats. (Ornithological Section.) Journ. Bombay Nat. Hist. Soc., **39**: 447–463, Sept. 25, 1937.—Conclusion of the notes on birds.

WHITE, C. M. N. Notes on Outer Hebridean birds. British Birds, **31**: 230–232, Dec. 1, 1937.

WILSON, I. D. An early report of lead poisoning in waterfowl. Science, new ser., **86**: 421, Nov. 5, 1937.—The discovery that ducks, geese and swan wintering in Back Bay, Virginia, and Currituck Sound, North Carolina, were being poisoned by ingesting lead shot, was reported to the U. S. Biological Survey by Harold H. Bailey while he was district inspector of migratory birds during the period from 1913 to 1917. Many of the preserved gizzards contained over one hundred no. 4 lead shot, which, being ground away by the action of the gizzard, produced symptoms typical of lead poisoning, and resulted in the ultimate death of the birds.

WIMAN, CARL. On supernumerary metapodials in *Aepyornis*, the Moas, and some other birds. Proc. Zool. Soc. London, **107**: ser. B, 245–256, 5 pls., July 1937.—The manus of *Aepyornis* is figured and discussed. The author interprets the structure as a fusion of digits 3 to 5 into a single solid mass; accepting Holmgren's conclusion that the three fingers of the bird's hand are digits 2 to 4, this implies the persistence of the fifth digit in this group of extinct birds. Similarly in the tarsus of some Moas, the presence of a fifth metatarsal is suggested to explain the small projection at the proximal end of the shaft. In the tarsus of other birds of

this group, the author regards as the remnant of a fifth metatarsal a low ridge on the postero-external side of the bone, with sometimes small foramina between it and the rest of the shank.

WITHERBY, H. F. [Habits of the Corsican Nuthatch.] Bull. British Ornith. Club, **58**: 4–6, Nov. 5, 1937.

ZIMMER, JOHN T. Studies of Peruvian birds. No. XXVII. Notes on the genera *Muscivora*, *Tyrannus*, *Empidonomus*, and *Sirystes*, with further notes on *Knipolegus*. Amer. Mus. Novitates, no. 962, 28 pp., Nov. 18, 1937.—New forms are: *Muscivora tyrannus sanctaemartae*, *M. t. circumdatus*, *Tyrannus melancholicus obscurus;* critical notes.

ZIMMER, JOHN T. Studies of Peruvian birds. No. XXVIII. Notes on the genera *Myiodynastes*, *Conopias*, *Myiozetetes*, and *Pitangus*. Amer. Mus. Novitates, no. 963, 28 pp., Nov. 18, 1937.—New are: *Myiodynastes maculatus tobagensis*, *M. m. difficilis*, *M. m. chapmani*, *Myiozetetes granadensis occidentalis*.

OBITUARIES

FRANK STEPHENS, a Member of the American Ornithologists' Union, died in San Diego, on October 5, 1937, as the result of being struck by a street-car ten days previously. Although he was in his eighty-ninth year, the vitality he displayed after the accident was amazing and reflected the energetic spirit which motivated his entire life as a field naturalist and collector.

Born on April 2, 1849, in a log house on a farm in Livingston County, New York, Stephens followed an ever-western trail, first with his parents and then with his bride, that brought him into the Southwest in pioneer days. To the late Charles E. Aiken, whom Stephens met at the age of twenty-four, while wintering in Colorado Springs, he gave credit for teaching him to prepare bird skins and encouraging his interest in natural history. Driving a yoke of oxen, he reached California in 1876, and settled first at Campo, in San Diego County, where the oak timber "looked very good" to him after the heat and barrenness of the Colorado Desert. From then on, he made his home most of the time in southern California, and in 1897 came to live permanently in San Diego. Shortly thereafter his first wife died, and in 1898 he married Miss Kate Brown, who has since been his close collaborator in his scientific work, and who survives him. No children were the offspring of either marriage.

Apart from his continuous interest in the securing of natural-history specimens wherever he might be, most of which are now in well-known collections, Stephens participated in several notable scientific expeditions. In 1891, he was a member of the Federal Government's Death Valley Expedition; in 1907, both he and Mrs. Stephens were collectors on the Alexander Expedition to southeastern Alaska; and in 1910 he accompanied Dr. Joseph Grinnell on the Colorado River Expedition of the Museum of Vertebrate Zoology. Intermittent field trips, particularly into the desert regions which appealed so strongly to him were continued almost up to the day he was stricken. The scientific names of animals and plants which bear his name offer evidence of the honor thus accorded him for his discoveries.

To Frank Stephens belongs the main credit for the development of the San Diego Society of Natural History from an obscure group of amateur naturalists to its present prominent position among the scientific organizations of the country. As member of the board of directors, secretary, field collector, taxidermist, author, man of all work—sometimes all of these together—he bore the chief burden of responsibility. In 1910, he donated to the Society his private collection of some two thousand birds and mammals, thereby laying the foundation for the subsequent continuous activity in these departments. He started the Society's scientific publications, and he was the first Director of the young and struggling museum, which, under the Society's auspices, has grown until today it occupies an imposing building in San Diego's Balboa Park. On the staff of this museum he bore the title of Curator Emeritus at the time of his death.

His versatility as a naturalist was astonishing. Ornithology, mammalogy, herpetology and even invertebrate paleontology all claimed his attention, but it is for his pioneer work with birds that he will probably be best remembered. Among the various scientific societies in which he was enrolled, he was advanced to the class of Members in the American Ornithologists' Union in 1901, to Honorary Membership in the Cooper Ornithological Club in 1912, and to Fellowship in the American Association for the Advancement of Science in 1926.

His writings consisted mainly of notes and new descriptions in 'The Auk' (beginning as long ago as 1878), 'The Condor,' and similar journals; the following contribu-

tions to the 'Transactions' of the San Diego Society of Natural History: 'Life areas of California' (1905), 'An annotated list of the birds of San Diego County, California' (1919), 'An annotated list of the mammals of San Diego County, California' (1921), 'An annotated list of the amphibians and reptiles of San Diego County, California' (1921), 'Notes on the marine Pleistocene deposits of San Diego County, California,' (1929); and his largest published work, a 350-page illustrated book on 'California Mammals,' privately printed in 1906.

At the request of the editor of 'The Condor,' he prepared a short autobiography in 1918, stating at the outset, "I do not like the task." These words provide an index to a marked characteristic in Stephens—his extreme modesty. He would never talk about himself, always minimizing his accomplishments as mere routine. He was asked, when advanced in years, whether he would not be willing to relate some of his experiences of bygone days—memories of Passenger Pigeons and buffaloes, adventures with hostile Indians, and the like—and allow them to be taken down in shorthand. But he never consented. It is his life's achievements, without any verbal embellishments, that will stand indefinitely as a tribute to his memory.—C. G. Abbott.

May Rogers (Mrs. Laurence J.) Webster, who was elected an Associate of the A. O. U. in 1936, died in Boston on January 7, 1938. Born in Scituate, Massachusetts, the eldest daughter of Thomas L. and Ella S. (Nickerson) Rogers, she spent most of her life since her marriage in 1901, at Holderness, New Hampshire, where her intense interest in Nature found expression in many ways, especially in the attracting of birds about her home and in gardening. Ten years ago she began experiments in taming wild Hummingbirds, and with such success that friends and others came from far and near to see the numbers of these birds that haunted her gardens and sipped from the tubes of sweets that she prepared for them. In 1932, she founded the New Hampshire Nature Camp at Lost River, having obtained for that use the State reservation. Here each summer she personally supervised the conduct of the camp which provided a course under competent instructors to prepare teachers, camp counsellors and others for giving work in nature study. Through her wide interest in this and other undertakings, she became a member of various natural-history organizations, and was national vice-chairman of education in the Garden Club of America, vice-president of the New England Wildflower Preservation Society, as well as a member of the Massachusetts Society of Colonial Dames.—G. M. A.

James J. Carroll, a Life Associate of the Union, died at Houston, Texas, his home, February 17, 1938. This sterling gentleman, a lumberman by profession and an ornithologist by life-long interest, was born near Caldwell, Burleson County, Texas, in 1876. His father died when young James was four years old, and he was brought up by an uncle and aunt, Dr. and Mrs. J. M. Carroll. From early days he was interested in birds, and carried this interest through to the day of his death. He was married in 1903 to Miss Lena Carter, a daughter of Mr. W. T. Carter of Houston, and became attached to the great Carter interests in lumber and building materials. At the time of his death he was president of the Carter Lumber Co., vice-president of the Carter Lumber and Building Co., and sales manager of W. T. Carter & Bros. He was a director in the Union National Bank of Houston, and a member of numerous sportsman's clubs.

Mr. Carroll was an invaluable aid to Texas bird students. His wide knowledge of birds resulted in but few publications, but when these did appear they were recognized as the work of an authority. His outstanding contribution was 'The birds of

Refugio County,' which appeared in 'The Auk.' As a collaborator with the National Association of Audubon Societies, Mr. Carroll stood supreme in Texas. The saving of the Roseate Spoonbill in that State stands as a monument to him, and the increase of the Reddish Egret is largely due to his never-failing efforts. Personnel of the Association were entertained at his home, taken on inspections on his beautiful cruiser, and given every possible aid. He selected wardens for the Association, and saw to it that they were on the job.

His work in bird photography stands as a peerless accomplishment. The life studies he made of Texas coastal birds are superb in their finish, wonderful in composition and masterly in every detail. His intense modesty was such that some of his best friends hardly knew that he was one of the country's outstanding wild-life photographers. Handicapped in his later years by a stroke of paralysis, it did not stop his photographic work, and he operated his graflex with one hand. Some of his pictures were on exhibition at the Charleston meeting of the A. O. U. in 1937, and he himself attended this meeting. Two of the pictures won a gold medal in England at an International Exhibition, the subjects being a Roseate Spoonbill and a Snowy Heron.

It was Mr. Carroll's expressed wish that his body be cremated and his ashes scattered over the bird islands of the Gulf of Mexico that he loved so well. He has gone from the world but he lives in the hearts of many as a true, staunch, ever-helpful friend. He is survived by his wife, three daughters and several grandchildren. We salute his memory.—A. Sprunt, Jr.

Mary Agnes Tillisch, an Associate Member of the A. O. U. for ten years, 1922–1932, died October 6, 1934, at the age of sixty-five. At the time of her death she had been for several years an instructor in nature study in Miss Wood's Kindergarten and Primary Training School, at Minneapolis, Minnesota. For forty years of her life she was a teacher, chiefly in kindergarten training schools and primary school departments. At one time she taught at the Fort Peck Indian Reservation, Poplar, Montana. Later in life she was connected with the extension division of the University of Minnesota, and also rendered voluntary assistance in lectures to children at the University Museum of Natural History and for a time assisted with the field work of the ornithology classes. Miss Tillisch loved her work, was well prepared in the subjects she taught, had a pleasing, direct personality and, though modest as to her abilities, left a wholesome and lasting impression on the children and young people with whom she came in contact.—T. S. Roberts.

NOTES AND NEWS

The Rôle of the A. O. U. in Ornithology Today

In the early days of its history, the A. O. U. exercised a directive, active influence in shaping the trends and tendencies of ornithology in America. Its early stimulus in the fields of bird protection and popularization of bird study gave rise to two organizations which have long since outstripped their parent in size, wealth, and influence—the Audubon Societies and the Biological Survey. Left thus with the pursuance of ornithological science as its sole remaining field, it has gradually lost its active rôle, aside from publishing a quarterly journal and the various editions of the 'Check-list,' and has become merely the passive recipient of such scientific activity as happened to take place. There is no longer a distinct need for the Union to engage actively in the fields covered by the two organizations to which it gave rise, although a critical sympathetic interest in those fields should always remain one of its societal characteristics. However, in the realm of scientific endeavor and progress, it should again assert its influence and attempt to mold, to encourage or discourage, as the case may be, different trends or developments. If the Union, composed, as it is, of the best ornithological experience and knowledge in America, cannot play a progressive and vigorous rôle in formulating or directing general tendencies in modern ornithology, then it is high time we called in the doctor. It is true that progress may come about without, or even in spite of, the Union—witness the growth, development, and organization of bird-banding. That the scientific results of this new technique have found their medium of expression chiefly outside of our journal is in many ways a loss to 'The Auk,' glad though we be for the success of the banding publications. But there are fields of limited popular appeal which are not less than basic for sound progress in ornithology,—avian physiology, genetics, psychology, to mention but a few,—and which need and deserve more than a careless approbation of an individual here and there. The old, well-established fields will take care of themselves; it is the new ones that need encouragement and aid. Even in the older fields there is need for some non-partisan body to act as an intermediary between institutions and individuals to bring about cooperative enterprises, to help avoid duplication of effort and expense, to prevent unnecessary repetition of outworn themes. The A. O. U. is precisely the body that should serve this function,—never authoritarian, always advisory, tolerant but with the courage of its own convictions.

It is to serve the Union in its rôle of serving ornithology with all the resources of knowledge, experience, judgment, and materials at its command that a Research Committee is in process of appointment with a number of subcommittees dealing with various specialties. It is hoped that the membership of our society will cooperate with the committee and make use of it.—Herbert Friedmann.

The Fifty-sixth Meeting of the American Ornithologists' Union will be held at Washington, D. C., October 17 to 21, 1938, with headquarters at the Hotel Raleigh, Twelfth and Pennsylvania Ave. It follows that July 17 next, is the last date upon which to submit nominations for the classes of Fellows and Members so that they may be acted upon at this meeting. Such nominations should if possible be in the hands of the Secretary by July 15.

THE FIFTY-FIFTH STATED MEETING OF THE AMERICAN ORNITHOLOGISTS' UNION

BY LAWRENCE E. HICKS

THE second Charleston meeting, held November 15–19, 1937, was well attended by members and visitors from widely separated places. Headquarters were at the Fort Sumter Hotel and most of the business sessions were held there. The public sessions were held at the Charleston Museum.

Business Sessions.—The meetings on Monday, November 15, included two sessions of the Council, a meeting of the Fellows at 4 p. m., and a meeting of the Fellows and Members at 8 p. m. At the meeting of the Fellows, Ernst Mayr and Mrs. Margaret Morse Nice were elected to fill vacancies in the list and Dr. R. A. Falla of New Zealand was named as a Corresponding Fellow. At the evening meeting, attended by twenty-two Fellows and twenty-four Members, six Members were added to the list.

The elections resulted in the addition of two Fellows, one Corresponding Fellow, six Members and 238 Associates. Herbert Friedmann succeeded A. C. Bent as President. J. L. Peters became the second Vice-President. J. Van Tyne, Hoyes Lloyd, T. S. Palmer and Robert C. Murphy, were added to the Council. Dr. T. S. Palmer retired as Secretary of 'The Union' after twenty years of service. His report indicated that the list of members in 1937 was about double that in 1917 when he assumed office. No changes were made in the other officers.

The award of the Brewster Medal was made to Dr. Robert Cushman Murphy in recognition of his work on the "Oceanic Birds of South America." Hereafter, this award will be made annually, instead of every two years as heretofore. Authorization was voted for the appointment of an active committee to canvass the situation relative to the development of an endowment fund. The following delegates were appointed to represent the Union at the Ninth International Ornithological Congress at Rouen, France, in May 1938: Alexander Wetmore, Assistant Secretary, Smithsonian Institution, in charge of the United States National Museum, Chairman of the Delegation; James P. Chapin, Associate Curator of Continental Old World Birds, The American Museum of Natural History, New York City; James Cowan Greenway, Jr., Assistant Curator of Birds, Museum of Comparative Zoology, Cambridge, Massachusetts; Lawrence E. Hicks, Bureau of the Biological Survey, Department of Agriculture, Columbus, Ohio; T. Gilbert Pearson, President Emeritus, National Association of Audubon Societies, New York City. Authorization was given to invite the Congress to meet in America in 1942.

It was voted to hold the 1939 meeting in California and the 1938 meeting

at Washington, D. C. The dates of the Washington meeting have since been set for October 17–21, 1938, with headquarters at the Hotel Raleigh. Hence, nominations for Members or Fellows to be voted upon at the 1938 meeting must be mailed to the Secretary before July 15, 1938. New nomination blanks have been printed and are available upon request.

The Union voted resolutions of thanks to the Director and staff of the Charleston Museum, to Hon. Burnet R. Maybank, Mayor of Charleston, to Dr. and Mrs. Buist, to the Society for the Preservation of Spirituals, and to the members of the Local Committee on Arrangements: E. Milby Burton, Chairman, E. Burnham Chamberlain, E. von S. Dingle, John B. Farrow, Peter Gething, D. E. Huger, Mrs. Alexander Martin, Mrs. Victor Morawetz, Dr. Eugene E. Murphey, Dr. John C. Phillips, Miss Josephine Pinckney, Herbert R. Sass, Aiken Simons, H. Jermain Slocum, Augustine T. Smythe, Alexander Sprunt, Jr., Simons V. H. Waring and Ellison A. Williams.

Public Meetings.—The public meetings opened on Tuesday morning with an address of welcome by Hon. Burnet R. Maybank, Mayor of Charleston, and a response on behalf of the Union by its President. The program included fifty-one papers, of which five were read by title, and as usual covered a wide range of subjects, both popular and technical. Twelve papers were illustrated with slides and an equal number with motion pictures. Classified as to content, the papers covered the following subjects: life history and behavior, 13; conservation, 6; waterfowl, 5; biography, 5; taxonomy, 4; fauna, 4; exploration, 4; song, 4; distribution and migration, 4; ecology, 3; management, 3; bird-banding, 3; population studies, 3; food habits, 1; and physiology, 1.

Exhibits.—An exhibit of birds for which South Carolina is the type locality, was displayed at the Museum. Exhibits of bird paintings by several contemporary artists were on view at the Museum and at the Gibbes Art Gallery.

Social Events.—On Tuesday evening an informal reception was given by the Charleston Museum in honor of those attending. An opportunity was given the large group present to inspect the Museum galleries, laboratories and collections. Wednesday evening was occupied by the annual dinner held at the Hibernian Hall. Those present considered the entertainment the finest ever witnessed at an annual dinner. This was provided by The Society for the Preservation of Spirituals.

On Thursday evening a tour of colonial Charleston homes was made. Six splendid mansions averaging about two hundred years of age, were opened especially for the members of the Union. This was a most pleasant experience in southern history, culture, beauty and hospitality.

Excursion.—Approximately two hundred persons participated in the

field excursion to Bull's Island, a part of the Cape Romain Waterfowl Refuge, on Friday, November 19. Motor boats and launches transported the party from the mainland by winding channels of salt marsh to a magic isle of live oaks festooned with Spanish moss, miles of lagoons through southern swamp forests, and immense expanses of marsh separated from the open sea by a thin barrier of sand dunes. An Arkansas Kingbird and Yellow-throated Warblers perched in the spreading live oaks under which a most welcome picnic dinner was served, including barrels of steaming oysters "on the whole shell." Shorebirds, waterfowl, and other wildlife were well represented in the area. Several observers listed more than a hundred bird species for the day—and more than 120 for the glorious week at Charleston.

THE PROGRAM

Papers are arranged in the order in which they were presented at the meeting. Starred papers were illustrated by lantern slides; those with a double star were illustrated by motion pictures.

TUESDAY MORNING

Welcome by HON. BURNET R. MAYBANK, Mayor of Charleston.

Roll Call of Fellows and Members, Report of the Business Meeting, Announcement of the Result of Elections.

Report of the Local Committee on Arrangements, E. MILBY BURTON, Director, The Charleston Museum, *Chairman.*

1. Remarks on the function of the A.O.U. Check-list. JOSSELYN VAN TYNE, University of Michigan, Ann Arbor, Michigan.
2. L. A. G. Bosc, a Charleston naturalist. FRANCIS HARPER, Swarthmore, Pa.
3. The bird life of White Top and Mt. Rogers, Va. J. J. MURRAY, Lexington, Va.
4. Some unpublished letters of John Bachman. E. B. CHAMBERLAIN, The Charleston Museum, Charleston, S. C.

4a. Ornithological observations in Foxe Basin, Franklin. REYNOLD J. BRAY, British Canadian Arctic Expedition, 1936–37.

5. A reconnaissance of the Pacific Coast of Colombia. ROBERT CUSHMAN MURPHY, American Museum of Natural History, New York.
6. Breeding bird populations in northeastern Ohio. JOHN W. ALDRICH, Cleveland Museum, Cleveland, Ohio.
7. *Homing instincts of birds. W. I. LYON, Waukegan, Ill.
8. *The fate of the Cape Sable Seaside Sparrow. A. H. HOWELL, Biological Survey, Washington, D. C.
9. Notes on international bird protection. T. GILBERT PEARSON, National Ass'n Audubon Societies, New York. (Read by title.)
10. In memoriam: Richard Crittenden McGregor, ornithologist of the Philippines. JOSEPH GRINNELL, Museum Vertebrate Zoology, Berkeley, California. (Read by title.)

TUESDAY AFTERNOON

11. **The life history of the Phoebe. MRS. HAROLD HIBBERT, Montreal, Canada.
12. **The first flight of the Tree Swallow. MRS. HAROLD HIBBERT, Montreal, Canada.

13. *Observations on the song of Kirtland's Warbler. HAROLD H. AXTELL, Cortland, N. Y.
14. **Bird life in the Uinta Basin, Utah. ARTHUR C. TWOMEY, Carnegie Museum, Pittsburgh, Pa.
15. *Relative abundance of winter birds in Middle Tennessee. A. F. GANIER, Nashville, Tenn.
16. **Exhibition of motion pictures of Wild Turkeys, Anhingas and Herons by T. K. Ellis. ALEXANDER SPRUNT, JR., Charleston, S. C.

WEDNESDAY MORNING—GENERAL SESSION

17. Spring activities of the Spotted Sandpiper. RALPH S. PALMER, Cornell University, Ithaca, N. Y.
18. Waterton versus Audubon. J. H. FLEMING, Toronto, Ontario.
19. Spring and fall migration at Lexington, Va. J. SOUTHGATE Y. HOYT, Lexington, Va.
20. Bird malaria and mosquito control. CARLTON M. HERMAN, Johns Hopkins University, Baltimore, Md.
21. The Gull Survey: an experiment in coöperation. J. J. HICKEY AND R. P. ALLEN, New York.
22. The biological significance of bird weights. MRS. MARGARET M. NICE, Chicago, Ill.
23. Critical remarks on the American Robin. W. E. CLYDE TODD, Carnegie Museum, Pittsburgh, Pa.
24. Notes on the migration of South American birds. JOHN T. ZIMMER, American Museum of Natural History, New York.
25. Preliminary notes on the breeding season behavior of the Eastern Willet. WILLIAM VOGT, National Ass'n Audubon Societies, New York.

WEDNESDAY MORNING—TECHNICAL SESSION

26. *A study of the home life of the Eastern Belted Kingfisher. HENRY MOUSLEY, Montreal, Canada. (Read by title.)
27. *Bicknell's Thrush: its life history and ecology. GEORGE J. WALLACE, Lenox, Mass.
28. *The frequency of passerine bird song as revealed by the study of sound-recording film. ALBERT R. BRAND (presented by Paul Kellogg), Cornell University, Ithaca, N. Y.
29. Preliminary studies of the behavior of the Black-crowned Night Heron. R. P. ALLEN AND F. P. MANGELS, New York.
30. A preliminary study of the relationships of the grackles of the genus *Cassidix*. GEORGE H. LOWERY, JR., Louisiana State University, Baton Rouge, La.
31. *Colored bands: methods of using bands and arranging data. FREDERICK P. MANGELS, Brooklyn, New York.
31a. Notes on the distribution of the Caspian Tern. MISS M. T. COOKE, Biological Survey, Washington, D. C.
32. Leg color in Royal Terns. E. B. CHAMBERLAIN, The Charleston Museum, Charleston, S. C.
33. *Further observations on early drawings of American birds. MRS. ELSA G. ALLEN, Ithaca, N. Y.

WEDNESDAY AFTERNOON

34. *Bird sanctuary magic. H. C. OBERHOLSER, Biological Survey, Washington, D. C.
35. **The Great Discovery of 1937. SAMUEL A. GRIMES, Jacksonville, Fla.
36. *The Congo Peacock (*Afropavo congensis*). JAMES P. CHAPIN, American Museum of Natural History, New York.
37. **Life history of the American Goldfinch. ALFRED O. GROSS, Bowdoin College, Brunswick, Me. (Read by title.)

THURSDAY MORNING

38. The place of ornithologists in wildlife conservation. LEONARD W. WING, Norris, Tenn.
39. *Wildlife conservation by the Soil Conservation Service. ERNEST G. HOLT, Soil Conservation Service, Washington, D. C.
40. The food of some uncommon, rare, and extinct North American birds. CLARENCE COTTAM AND MISS PHOEBE KNAPPEN, Biological Survey, Washington, D. C.
41. A statistical study of the breeding habits of the English Sparrow. RICHARD WEAVER, Cornell University, Ithaca, N. Y.
42. The North American flyways. FREDERICK C. LINCOLN, Biological Survey, Washington, D. C.
43. **The northern breeding grounds of the Atlantic flyway. HAROLD S. PETERS, Biological Survey, Washington, D. C.
44. **The northern breeding grounds of the Mississippi flyway. CHARLES E. GILLHAM, Biological Survey, Washington, D. C.
45. Habitat improvement for migratory birds on federal refuges. W. F. KUBICHEK, Biological Survey, Washington, D. C.
46. Federal refuges and non-game birds. J. CLARK SALYER, II. (Read by W. F. Kubichek), Biological Survey, Washington, D. C.

THURSDAY AFTERNOON

47. **Wilderness night filming (A new technique in wildlife photography). HOWARD H. CLEAVES, Staten Island, N. Y.
48. **The birds of the Machias Seal Island. OLIN S. PETTINGILL, JR., Carleton College, Northfield, Minn.
49. **Recording petrel and other bird songs by radio at the Bowdoin Kent's Island Scientific Station, Bay of Fundy. A. O. GROSS AND A. R. BRAND. (Read by title.)
50. **A season with camera and microphone. ARTHUR A. ALLEN, Cornell University, Ithaca, N. Y.

The second Charleston meeting was considerably larger than that held there in 1928, when 130 members were present. The list of those present in 1937 included one Patron, 23 Fellows, 31 Members, 97 Associates, and 82 visitors, making a total of 234.

Twenty-nine states and provinces were represented in the attendance. Excluding visitors, the five largest delegations were: District of Columbia, 25; New York, 24; Pennsylvania, 17; South Carolina, 10; and Illinois, 9.

Distant states and provinces represented included: Quebec, Ontario, Minnesota, Texas and California. Fifteen museums, twelve colleges and universities, and ten conservation organizations had delegates present.

CALIFORNIA, 1—*Member*, Robert T. Moore, Pasadena.

CONNECTICUT, 2—*Associates*, Margaret Brooks, Old Greenwich; Walter W. Naumburg, New Canaan.

DELAWARE, 1—*Associate*, C. B. Moseley, Wilmington.

DISTRICT OF COLUMBIA, 25—*Fellows*, Herbert Friedmann, Arthur H. Howell, F. C. Lincoln, W. L. McAtee, H. C. Oberholser, T. S. Palmer, Edward A. Preble; *Members*, H. C. Bryant, Miss May T. Cooke, Clarence Cottam, E. G. Holt, F. M. Uhler, Robert W. Williams; *Associates*, G. A. Ammann, Charles H. M. Barrett, Victor H. Cahalane, Mrs. Jane S. Elliott, H. H. T. Jackson, Miss Phoebe Knappen, W. F. Kubichek, Robert C. McClanahan, Mrs. T. S. Palmer, Harold S. Peters, L. W. Saylor, Clarence F. Smith.

FLORIDA, 3—*Member*, Francis M. Weston, Pensacola; *Associates*, S. A. Grimes, Jacksonville; Miss S. W. Partridge, Tallahassee.

GEORGIA, 6—*Fellow*, Herbert Stoddard, Thomasville; *Associates*, Mrs. Victor H. Bassett, Savannah; Earle R. Greene, Fargo; Mrs. Hugh H. Harris, Emory; E. E. Murphy, Augusta; Ivan R. Tomkins, Savannah.

ILLINOIS, 9—*Patron*, Mrs. Ruthven Deane, Winnetka; *Fellow*, Mrs. M. M. Nice, Chicago; *Members*, W. R. Boulton, Chicago; Edward R. Ford, Chicago; W. I. Lyon, Waukegan; *Associates*, Mrs. H. L. Baldwin, Chicago; C. E. Gillham, Edwardsville; Mrs. Hermon D. Smith, Lake Forest; Earl G. Wright, Chicago.

INDIANA, 1—*Associate*, S. E. Perkins, III, Indianapolis.

KENTUCKY, 2—*Associates*, Cleveland P. Grant, Covington; Burt L. Monroe, Louisville.

LOUISIANA, 1—*Associate*, George H. Lowery, Baton Rouge.

MAINE, 1—*Associate*, Ralph S. Palmer, Brunswick.

MARYLAND, 2—*Associates*, W. C. Henderson, Chevy Chase; C. M. Herman, Baltimore.

MASSACHUSETTS, 7—*Fellows*, Glover M. Allen, Cambridge; James L. Peters, Harvard; *Member*, John B. May, Cohasset; *Associates*, Carl W. Buchheister, Hingham; John H. Conkey, Ware; G. B. Hendricks, Pittsfield; Norman A. Preble, Wakefield.

MICHIGAN, 6—*Fellow*, Josselyn Van Tyne, Ann Arbor; *Member*, M. D. Pirnie, Augusta; *Associates*, Mrs. Edith K. Frey, Jackson; Harry W. Hann, Ann Arbor; Thomas D. Hinshaw, Ann Arbor; M. J. Magee, Sault Ste. Marie.

MINNESOTA, 1—*Member*, O. S. Pettingill, Jr., Northfield.

NEW JERSEY, 1—*Member*, B. S. Bowdish, Demarest.

NEW YORK, 24—*Fellows*, A. A. Allen, Ithaca; J. P. Chapin, New York; R. C. Murphy, New York; J. T. Zimmer, New York; *Members*, Verdi Burtch, Branchport; F. L. Jaques, New York; Mrs. W. W. Naumburg, New York; R. T. Peterson, New York; James Savage, Buffalo; William Vogt, New York; *Associates*, Harold H. Axtell, Cortland; Mrs. Arthur A. Allen, Ithaca; John H. Baker, New York; Howard H. Cleaves, Staten Island; George E. Hix, Brooklyn; Paul Kellogg, Cortland; F. P. Mangels, Bellmore; Mrs. Grace E. B. Murphy, Bronxville; Richard H. Pough, New York; E. J. Sawyer, Ithaca; Carll Tucker, New York; Mrs. Carll Tucker, New York; Lester L. Walsh, Bronxville; Richard Weaver, Ithaca.

NORTH CAROLINA, 3—*Associates*, Miss Ethel B. Finster, Asheville; Mrs. R. W. Green, Raleigh; C. E. Gregory, Morganton.

OHIO, 7—*Fellow*, Francis H. Herrick, Cleveland; *Member*, Lawrence E. Hicks, Columbus; *Associates*, J. W. Aldrich, Cleveland; Herbert W. Brandt, Cleveland; Arthur B. Fuller, Cleveland; William C. Herman, Cincinnati; Frank M. Phelps, Elyria.

ONTARIO, 5—*Fellows*, J. H. Fleming, Toronto; Hoyes Lloyd, Ottawa; W. E. Saunders, London; P. A. Taverner, Ottawa; *Member*, L. L. Snyder, Toronto.

PENNSYLVANIA, 17—*Fellows*, Witmer Stone, Philadelphia; W. E. Clyde Todd, Pittsburgh; *Members*, Francis Harper, Swarthmore; Wharton Huber, Philadelphia; John F. Street, Philadelphia; *Associates*, J. M. Cairns, Scranton; Mrs. Francis H. Coffin, Scranton; Arthur C. Emlen, Philadelphia; Horace Groskin, Ardmore; Mrs. Wharton Huber, Philadelphia; Horace D. McCann, Paoli; N. J. McDonald, Philadelphia; Mrs. Witmer Stone, Philadelphia; Miss Ruth Trimble, Pittsburgh; Arthur C. Twomey, Pittsburgh; H. T. Underdown, Elkins Park; C. B. Worth, Swarthmore.

QUEBEC, 2—*Associates*, J. D. Cleghorn, Montreal; Mrs. Harold Hibbert, Montreal.

SOUTH CAROLINA, 11—*Member*, Alexander Sprunt, Jr., Charleston; *Associates*, E. M. Burton, Charleston; E. B. Chamberlain, Charleston; Edward S. Dingle, Huger; Mrs. Mary D. Dise, Charleston; Miss Louise P. Ford, Aiken; H. L. Harllee, Florence; Miss M. J. Pellew, Aiken; Herbert R. Sass, Charleston; E. A. Simons, Charleston; Ellison A. Williams, Charleston.

TENNESSEE, 6—*Members*, A. F. Ganier, Nashville; J. M. Shaver, Nashville; *Associates*, John B. Calhoun, Nashville; Mrs. Amelia R. Laskey, Nashville; Harry C. Monk, Nashville; Leonard W. Wing, Norris.

TEXAS, 1—*Associate*, J. J. Carroll, Houston.

VERMONT, 2—*Member*, W. P. Smith, Wells River; *Associate*, George J. Wallace, Montpelier.

VIRGINIA, 3—*Member*, J. J. Murray, Lexington; *Associates*, J. Southgate Y. Hoyt, Lexington; Otis B. Taylor, Richmond.

WEST VIRGINIA, 1—*Associate*, John W. Handlan, Wheeling.

WISCONSIN, 1—*Associate*, Elizabeth A. Oehlenschlaeger, Milwaukee.

ELECTION OF OFFICERS

The election of officers for 1938 resulted as follows: President, Herbert Friedmann; Vice-Presidents, J. P. Chapin and J. L. Peters; Secretary, Lawrence E. Hicks; Treasurer, W. L. McAtee; Members of Council (in addition to officers and ex-presidents), for two years, J. Van Tyne; for three years, Hoyes Lloyd, T. S. Palmer, Robert C. Murphy.

The Council elected Glover M. Allen, Editor of 'The Auk'; W. L. McAtee, Business Manager; George H. Stuart, 3d, C. H. Riker and Edward Norris, Trustees; and Herbert Friedmann, S. S. Gregory, Jr., Ludlow Griscom, W. L. McAtee, and Lawrence E. Hicks, members of the Finance Committee.

ELECTION OF FELLOWS, MEMBERS AND ASSOCIATES

FELLOWS—2.

Ernst Mayr, New York City.

Mrs. Margaret Morse Nice, Chicago.

CORRESPONDING FELLOW—1.

R. C. Falla, Christchurch, New Zealand.

MEMBERS—6.

W. P. Brodkorb, Ann Arbor, Michigan.

James Moffitt, San Francisco.

M. D. Pirnie, Augusta, Michigan.
O. S. Pettingill, Jr., Northfield, Minnesota.
W. P. Smith, Wells River, Vermont.
F. M. Uhler, Washington, D. C.

ASSOCIATES—238.

The names of Associates who have qualified will appear in 'The Auk' for April, 1938.

DECEASED MEMBERS

During the year the Union lost at least four members by death—1 Fellow, no Corresponding Fellows, 3 Members, and no Associates.

RICHARD CRITTENDEN MCGREGOR,[1] Fellow, aged 65, died at Manila, Philippine Islands, on December 30, 1936.

AMOS WILLIAM BUTLER,[2] Member, aged 77, died at Indianapolis, Indiana, Aug. 5, 1937.

FREDERICK HEDGE KENNARD,[3] Member, aged 72, died at Brookline, Massachusetts, on February 24, 1937.

THOMAS E. PENARD,[4] Member, aged 58, died at Cambridge, Massachusetts, Oct. 27, 1936.

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[1] For obituary notice, see Auk, vol. 54: 234, 1937.
[2] " " " " " " 54: 573–574, 1937.
[3] " " " " " " 54: 234, 1937.
[4] " " " " " " 54: 232–234, 1937.

Treasurer's Annual Report

The American Ornithologists' Union in account with W. L. McAtee, Treasurer, for the period October 1, 1936, to October 31, 1937, inclusive. [13 months.]

Receipts

Balance, September 30, 1936		$ 630.53
Receipts for the fiscal year:		
Dues	$4683.04	
Subscriptions	909.61	
Sales of publications	533.02	
Remittance from the Investing Trustees	662.99	
Life Membership fees	300.00	
Contributions	543.31	
Miscellaneous	97.61	
Total receipts for the fiscal year		7729.58
Grand total of receipts including balance from previous year		$8360.11

Disbursements

Manufacture of 'The Auk' and reprints thereof	$4581.08	
Expenses connected with handling the reserve stock of publications	51.40	
Honorarium and expenses of the Editors (two individuals involved and part of the expenses of Dr. Stone being for the calendar year 1935. Most of this was turned over by Dr. Stone as a contribution to the Union)	763.28	
Honorarium and expenses of the Secretary	391.87	
Expenses of the Treasurer and Business Manager, including clerical assistance	1008.43	
Contribution to the Zoological Society of London in support of the Zoological Record	25.00	
Contribution to the expenses of the Pittsburgh meeting ($50.00 of this was returned)	150.00	
Miscellaneous disbursements including audit of accounts for the previous year	131.01	
Total disbursements by the Treasurer		$7102.07
Charges by bank for unpaid checks		16.50
Grand total of disbursements		$7118.57

Recapitulation

Total receipts	$8360.11
Total disbursements	7118.57
Balance, October 31, 1937	$1241.54

REPORT OF THE COMMITTEE ON BIRD PROTECTION, 1937

THROUGH International Treaty now ratified by both countries, birds migrating between the United States and Mexico have received much needed protection. The new regulations, issued March 15, 1937, prescribe protection for one hundred and forty species. Commerce in songbirds such as mockingbirds, thrashers and buntings will be controlled, for transportation of game, mammals, or migratory birds dead or alive is prohibited except by permit.

Among species of birds dangerously near extinction is the Great White Heron of Florida. With a restricted breeding range this bird not only has been persecuted by fishermen but has to withstand hurricanes that occasionally sweep over its breeding grounds. The hurricane of Labor Day, 1935, struck the species a serious blow, but that it now numbers in the hundreds has been demonstrated by careful censuses made by field agents of the National Association of Audubon Societies. Plans are on foot to set aside as a bird refuge the series of islands in Florida Bay where this bird breeds. Likewise, fears have been allayed as to the status of the Glossy Ibis in Florida with the counting of some 650 birds found nesting in seven different localities. With an improved warden patrol in the Everglades section, dependable knowledge of the status and success of each nesting season is coming into print. Evidence that laws protecting eagles can be enforced and convictions obtained comes to us from the Province of Ontario where, through efforts of the Hamilton Bird Protection Society, another conviction has been obtained.

The publication of newspaper items relative to expeditions to view California Condors in the mountain fastnesses of Ventura County, California, led to the writing of a letter to the Forest Service expressing fear that such publicity would mean further disturbance of the few remaining birds. An answer brought the good news that plans were being made to create a "non-trespass" area for the protection of the Condor and that even scientific expeditions would be discouraged. Such an area has now been created under regulations authorizing the closing of designated areas "for the perpetuation and protection of rare and vanishing species." In issuing instructions, the statement was made that "the California Condor is an illustration of a species of rare bird requiring an undisturbed habitat and nesting places and an area sufficient to provide such refuge from human disturbance." This increased protection of the nesting grounds of the Condor on Sisquoc Falls Creek is timely and encouraging to those who know of the critical status of this great vulture.

The wildfowl situation is about what it was a year ago,—still something

to worry about. Drought and too heavy a toll by hunters has produced a situation that cannot be cured in a short time. The decreed hunting season will cover seventy-nine days with a maximum of thirty days in any one zone. The only changes in bag limit are an increase from fifteen to twenty-five on Coots (Mud-hens), four to five on Canada Geese, and decrease from twenty-five to fifteen on Sora Rail. We must continue to furnish wildfowl with extraordinary safeguards if they are to return to their former numbers. Some encouragement is to be found in the fact that newly established Government refuges are proving effective breeding and wintering grounds. Thousands of acres of land have been flooded and waterfowl have quickly found these safe new breeding sites. Doves received added protection through a reduced season in Texas and Arizona.

Oil pollution, unfortunately, continues. But the League of Nations has under consideration the calling of an international conference looking to the abatement or eradication of the pollution problem through international cooperation. While the Vinson Bill (H. R. 2711) provides no means for effectively controlling the pollution menace, it nevertheless was passed by the House by a vote of 187 to 121. It was amended in the Senate and sent to conference. The best provisions of the Lonergan Bill (S. 13) which provides for actual pollution control now have been incorporated in the Vinson Bill and support is needed to pass it for it will be actively opposed by industrial interests. This important bill declares that discharge of waste into navigable waters is a public nuisance, and provides for court action against polluters. The enforcing agency is designated as a Division of Water Pollution Control under the United States Public Health Service with a Director who would be a commissioned engineer officer of the Service. This is a conservation measure which deserves active support of all those who seek means of giving better protection to wildlife.

There is a pleasing trend toward the teaching of conservation of natural resources in the public schools. During May, the Federal Office of Education held a two-day conference of educators interested in furthering this type of teaching. Cornell University is making a survey of conservation teaching throughout the United States. Wisconsin has passed a law requiring that conservation be taught in the schools of that State. Complying with that mandate a bulletin was prepared on the purposes, content and significance of conservation to assist teachers in dealing with the subject. Also as an aid to teachers the Office of Education issued 'Conservation in the Education Program' by William H. Bristow and Katherine M. Cook (Bull. No. 4, 1937). This helpful bulletin outlines representative practices in conservation education in various States, lists various governmental and non-governmental agencies which engage in educational conservation activities and closes with a brief bibliography. Bird protection will certainly

find a place in any school curriculum including conservation teaching and we may hope that coming generations will have a better appreciation of the value of birds and a better knowledge of means of protecting them.

A report on an inspection tour of Texas sanctuaries states than an increase in number of Spoonbills was evident but that the Brown Pelican, still unprotected by either Federal or Texas law, has been systematically killed by fishermen and breeding colonies are showing a progressive decrease. This situation is a reminder that prejudice rather than accurate knowledge still determines safety of some species of birds. More accurate and convincing information on food habits and educational programs to make such information common knowledge to the public will best meet this situation.

Interest of the general public in bird sanctuaries is on the increase. Proof is to be found in the numerous Federal, State and even County programs which have been developed and in the augmented sanctuary fund of the National Association of Audubon Societies.

Drainage projects, although apparently less numerous than in the past few years, continue to reduce available nesting grounds for waterfowl. The National Association of Audubon Societies has actively opposed many projects and has aided in making the public aware of the real dangers to wildlife which follow drainage operations.

Your Committee has been informed that a special fund is at its disposal for current bird-protection activities. This is appreciated and plans are being formulated as to the best use to be made of this financial help. Your Bird Protection Committee still feels that a resolution expressing conservation ideals relative to scientific collecting would be an effective instrument in setting high standards for both present and future collectors. After a study of the International Committee resolution and other resolutions on the same subject, one was drawn and submitted last year which failed to be adopted by the Council and did not come to a vote in open meeting. The Committee again submits this resolution with but slight revision and urges its adoption in open meeting in order to establish a clear-cut policy on scientific collecting, as follows:—

RESOLUTION: The American Ornithologists' Union recognizes that increased exploitation of natural resources everywhere has placed pressure on many species of birds, and has brought about an alarming reduction in numbers of some species. Though standing staunchly, as heretofore, for adequate opportunity for the scientific collector to obtain specimens necessary to the furtherance of scientific study, the Union opposes the collecting of bird specimens or eggs as objects of curiosity, or personal or household adornment, and any scientific or other collecting or investigational activities which may in any way endanger or adversely affect the

status of seriously depleted species by molestation, invasion of territory or otherwise.

Respectfully submitted,

H. C. BRYANT, *Chairman*
Mrs. FLORENCE M. BAILEY
BAYARD CHRISTY
E. A. PREBLE
W. E. SAUNDERS
G. M. SUTTON

BY-LAWS AND RULES OF THE AMERICAN ORNITHOLOGISTS' UNION

By-Laws

Article I. Of Members

Section 1. The membership of the Union shall consist of the following Classes: (1) Fellows, (2) Emeritus Fellows, (3) Honorary Fellows, (4) Corresponding Fellows, (5) Members, (6) Associates, and (7) Patrons.

Section 2. Fellows shall be residents of the United States or Canada, and shall be limited to fifty in number.

Section 3. Emeritus Fellows shall be persons who, by their own desire and by vote of the Council, have been transferred to this Class from the Class of Fellows.

Section 4. Honorary Fellows shall be limited to twenty-five in number. They shall be chosen for their eminence in Ornithology, and may be residents of any country.

Section 5. Corresponding Fellows shall be limited to one hundred in number, and may be residents of any country.

Section 6. Members shall be residents of the United States or Canada, and shall be limited to one hundred and twenty-five in number.

Section 7. Associates shall be residents of any country, and shall not be limited in number.

Article II. Of Officers

Section 1. The Officers of the Union shall be a President, two Vice-Presidents, a Secretary, a Treasurer, and nine Councilors. These officers, together with the Ex-Presidents, shall constitute the Board of Management or Council of the Union, for the transaction of such business as may be assigned to it by the By-Laws or by the Union.

Section 2. The President or, in case of his absence or inability to act, one of the Vice-Presidents shall preside at the meetings of the Union and of the Council, and shall appoint all Committees except such as are otherwise provided for.

Section 3. The Secretary shall keep a record of the meetings of the Union and of the Council; shall give at least three weeks' notice to the Fellows, Emeritus Fellows, Members and Associates of the time and place of meetings, shall report to the Council all nominations for membership received by him, and, at least three weeks before each Stated Meeting, shall

send to each Fellow a list of the nominees for the classes of Fellows and Members, and to each Member a list of the nominees for the Class of Members, with a statement of the residence of each nominee and the names of the Fellows or Members signing his nomination; and also shall notify the Fellows of all proposed changes in the By-Laws; shall notify all members-elect of their election, and Committees of their appointment; shall acknowledge all donations to the Union, and report the same at the next Stated Meeting; and he shall have charge of the corporate seal of the Union.

Section 4. The Treasurer shall receive all moneys due or payable to the Union, and shall pay all accounts against it when the same have been approved by the President. He shall receive officially all moneys given or bequeathed to the Union, and shall transmit all principal to the Trustees. He shall make a report of receipts and disbursements to the Union at each Stated Meeting.

Section 5. Vacancies occurring in any office may be filled by the Council until the next annual election.

Article III. Of Meetings

Section 1. Stated Meetings of the Union shall be held annually, at such time and place as the Union may determine. The time and the place for any Stated Meeting, appointed by the Union, may be changed by the Council by a two-thirds vote of its members. Special meetings shall be called by the Council as occasion may require, due notice thereof being given by the Secretary.

Section 2. In meetings of the Fellows a quorum for the transaction of business shall consist of ten Fellows; in meetings of the Fellows and Members it shall consist of fifteen Fellows and Members.

Section 3. Five members of the Council shall constitute a quorum for the transaction of business.

Section 4. The scientific meetings of the Union shall be open to the public, unless otherwise ordered by a majority of the Fellows and Members present.

Section 5. Stated Meetings of the Council shall be held immediately preceding each Stated Meeting of the Union and on the day following the election. Special meetings of the Council may be called by the President and Secretary, or by any four members of the Council.

Article IV. Of Elections, Resignations, and Expulsions

Section 1. All elections shall be by ballot. Officers, Fellows, Honorary Fellows and Members shall be elected individually.

Section 2. All Officers, except members of the Council, shall be elected annually. Members of the Council shall be divided into three classes, three members to serve for one year, three for two years and three for three years, and at subsequent elections members of each class shall be elected for three years as their terms expire, but shall not be eligible to succeed themselves, although they may be reelected at a subsequent meeting. The term of office shall begin at the close of the Stated Meeting at which they are elected and the Officers shall continue in office until their successors qualify.

Section 3. Elections of Officers are to be held as follows: In each case nominations shall be made by means of an informal ballot, the result of which shall be announced by the Secretary; after which the first formal ballot shall be taken.

In the ballot for Vice-Presidents, and for members of the Council, each voter may write on one ballot as many names as there are officers to be elected, viz., two on the first ballot for Vice-President, and seven on the first ballot for members of the Council; and on each subsequent ballot as many names as there are persons yet to be elected; and those persons who receive the votes of a majority of the Fellows and Members voting shall be declared elected, provided that the number of persons receiving such majority does not exceed the number of persons to be elected, in which case the vacancies shall be filled by the candidates receiving the highest majorities.

If in any case the informal ballot result in giving a majority for any of the candidates, it may be declared formal by a majority vote.

Section 4. Nominations to the classes of Fellows and Members shall be made in writing; each nomination for Fellow or Member shall be signed by three Fellows or Members; shall state the candidate's name in full, and his residence; and shall be delivered to the Secretary at least three months prior to the Stated Meeting at which it is to be voted on.

Section 5. Elections to the classes of Fellows shall be held in the following manner: The number to be elected shall be first decided by a majority vote of the Fellows present at the Stated Meeting at which the election is to be held, but not more than five Fellows shall be elected in any one year.

At each ballot each Fellow present may vote for nominees not exceeding the full number of vacancies to be filled, and the person receiving the highest number of votes shall be declared elected, provided that he receives the votes of at least two-thirds of the Fellows present, and so on until all the vacancies are filled. Any candidate who, in each of five successive ballots, fails to receive the votes of half of the Fellows present shall cease to be a candidate during the remainder of the Stated Meeting.

The election may be suspended at any time by a majority vote of the Fellows present.

During election a discussion of the merits of nominees will be in order.

Section 6. Elections to the class of Members shall be held in the following manner: The number to be elected shall be first decided by a majority vote of the Fellows and Members present at the Stated Meeting at which the election is to be held, but not more than ten members shall be elected in any one year.

At each ballot each Fellow and Member present may vote for nominees not exceeding the full number of vacancies to be filled, and the person receiving the highest number of votes shall be declared elected, provided that he receives the votes of at least two-thirds of the Fellows and Members present, and so on until all the vacancies are filled. Any candidate who, in each of five successive ballots, fails to receive the votes of half the Fellows and Members present, shall cease to be a candidate during the remainder of the Stated Meeting.

The election of Members may be suspended at any time by a majority vote of the Fellows and Members present.

During election a discussion of the merits of nominees will be in order.

Section 7. The nomination of Honorary Fellows, Corresponding Fellows, and Associates shall be made by the Council to the Union, and such members shall be elected by ballot, and the affirmative votes of three-fourths of the Fellows and Members present shall be necessary to a choice. Honorary and Corresponding Fellows shall be enrolled upon signifying acceptance of membership.

Proposals for the class of Associates may be made to the Council through the Secretary by any Fellow or Member.

Section 8. Fellows only shall be eligible to the offices of President and Vice-President. Members shall share with Fellows the right to vote, to hold the offices of Secretary, Treasurer and Member of Council, and to take part in the business of the Union, except that Members shall not take part in the election of Fellows, nor in the amendment of By-Laws.

Emeritus, Honorary and Corresponding Fellows, and Associates may attend meetings, present papers, and take part in the scientific proceedings of the Union.

Section 9. Every Honorary and Corresponding Fellow-elect shall notify the Secretary of his acceptance of membership within one year, and every Fellow-elect, Member-elect and Associate-elect within six months, from the date of election; in default of which notification, his name shall not be entered on the roll of members.

Section 10. Resignations shall be addressed to the President and acted on by the Council.

Section 11. Any member may be expelled from the Union on satisfactory evidence that said member is an improper person to be connected with the

Union, or has made improper use of his membership; such expulsion shall be by a two-thirds vote of the Fellows and Members present at a Stated Meeting, three months' previous notice of such proposed action having been given by the Secretary to each Fellow and Member and to the member accused.

Article V. Of Fees and Assessments

Section 1. The annual dues shall be for Fellows five dollars, for Members four dollars and for Associates three dollars.

No dues shall be required of Emeritus, Honorary, or Corresponding Fellows.

Section 2. The annual assessment for the ensuing year shall fall due on the first day of each Stated Meeting, and shall be in arrears if not paid in ninety days thereafter.

Section 3. No Fellow, nor Member, in arrears for dues, shall be entitled to vote or take part in the business of any meeting.

Section 4. The name of any member one year in arrears for dues shall be removed from the roll of membership unless otherwise ordered by the Council; provided that two notices of indebtedness shall have been given him by the Treasurer, at intervals of three months.

Section 5. Fellows, Members and Associates not in arrears for dues, and Emeritus Fellows, shall receive the regular serial publication of the Union, entitled 'The Auk,' gratis. All the publications of the Union shall be sent gratis to Honorary Fellows.

Section 6. Life membership, exempting the holder from all further dues or assessments, may be obtained by a Fellow on payment of one hundred dollars, by a Member on payment of seventy-five dollars, or by an Associate on payment of fifty dollars. But any Member or Associate, in event of his election to a higher class of membership, must then pay such additional sum as will make his total payments for life membership equal to the amount required for the class to which he is elected. In default of such payment his life membership lapses; but in that event there shall be credited toward his future annual assessments, any excess there may be in the amount he has already paid for life membership over that which he otherwise would have paid as annual assessments during the time he has held life membership.

Section 7. Any person desirous of furthering the aims of the Union may become a Patron thereof on payment of the sum of one thousand dollars, and his name shall be perpetually inscribed upon the records of the Union.

Article VI. Of Scientific Communications and Publications

Section 1. The Union may publish, under the direction of the Council, a serial journal of Ornithology, called 'The Auk,' and such reports, proceedings, memoirs, and other works on Ornithology as the Council may authorize.

Section 2. Communications on Ornithology may be read at the Stated Meetings of the Union, by any member, or for him by any other member, notice of the same having been previously given to the Secretary.

Section 3. Any member may read a paper for a person who is not a member, and shall not be considered responsible for the facts or opinions expressed by the author, but shall be held responsible for the appropriateness of the paper. Persons who are not members may read papers on invitation of the President, and with the approval of the Committee of Arrangements.

Article VII. Of the Property of the Union

Section 1. A board of three Trustees elected by the Council at each Annual Meeting shall hold all the funded property of the Union in trust with power to sell and to reinvest according to their judgment.

Section 2. No contract shall be binding upon the Union which has not been authorized by the Council. No liability exceeding one thousand dollars, nor total debt exceeding two thousand dollars, shall be incurred by the Council without the formal consent of the Union, as expressed by a majority vote at a Stated Meeting.

Section 3. Bequests and trusts having for their object the advancement of Ornithology, may be accepted and administered by the Union. Such devices, bequests, donations, or gifts having for their object the promotion of science or the welfare of the Union, may be accepted by the Council for the Union. Before acceptance of any such trust the Council shall consider the object of the trust and all conditions or specifications attached thereto, and shall make a report of its action to the Union. Unless otherwise provided by the deed of gift, the income of each trust fund shall be applied to the objects of that trust by the action of the Union on the recommendation of a standing committee of that fund.

Article VIII. Of Additions and Amendments to the By-Laws

Notice of proposed additions or amendments to the By-Laws must be in writing, signed by two Fellows, and must be given at a session of the Fellows in a Stated Meeting of the Union. All such propositions shall be referred to the Council, which may amend the propositions, and shall report

thereon to the Fellows at the same session. Its report shall be considered by the Fellows in committee of the whole for amendment. The proposition, as amended, if adopted in committee of the whole, shall be voted on by the Fellows at the next Stated Meeting, and if it receive two-thirds of the votes cast it shall be declared adopted.

Absent Fellows may send their vote on pending changes in the By-Laws to the Secretary in writing, and such votes shall be counted as if the Fellows were present.

Rules

I. In the absence of the President and Vice-Presidents, a Fellow shall be chosen, or in the absence of the Secretary or Treasurer a Fellow or Member, to perform the duties of the office *pro tempore* by a plurality of *viva voce* votes, upon open nomination.

II. The order of business at Stated Meetings shall be as follows:

First Day's Session

The first session of each Stated Meeting shall be a meeting of the Fellows, for the election of Fellows, and the amendment of By-Laws.

The second session of each Stated Meeting shall be the annual business session, for the reception of the reports of the Secretary and Treasurer, the election of officers and members, and action on business reported from the Council, or such other business as may be brought before it, to which session only Fellows and Members shall be admitted. When not otherwise ordered, the annual business session shall be held on the day preceding the first public session.

1. Chair taken by the President, or, in his absence, by one of the Vice-Presidents.
2. Roll-call of Fellows and Members by the Secretary.
3. Reading and approval of the minutes of the previous meeting.
4. Selection of time and place of next Stated Meeting.
5. Report of the Secretary.
6. Report of the Treasurer.
7. Report of the Council, including nominations for membership and other business or recommendations.
8. Election of officers for the ensuing year, preceded by the reading by the Secretary, of the By-Law covering the election of officers.
9. Election of members.
    - *a.* Honorary Fellows.
    - *b.* Corresponding Fellows.
    - *c.* Members.
    - *d.* Associates.

10. Action on business reported from the Council.
11. Appointment by the President of a Committee of three to audit the accounts of the Treasurer.
12. Appointment by the President of a Committee on Resolutions.
13. Reports of Committees.
14. Miscellaneous business.
15. Adjournment.

Second and Third Days' Sessions

1. Chair taken by the President, or, in his absence, by one of the Vice-Presidents.
2. Roll-call of Fellows and Members by the Secretary.
3. Reading and approval of minutes of previous day's session.
4. Report of the Auditing Committee.
5. Report of the Council.
6. Action on business reported from the Council.
7. Reports from Committees.
8. Miscellaneous business.
9. Presentation and discussion of scientific papers, or remarks.
10. Adjournment.

Last Day's Session

1. Chair taken by the President, or, in his absence, by one of the Vice-Presidents.
2. Roll-call of Fellows and Members by the Secretary.
3. Reading and approval of minutes of previous day's session.
4. Appointment by the President of a Committee, consisting of three Fellows or Members, to co-operate with the President and Secretary as a Committee of Arrangements for the next Stated Meeting.
5. Report from the Council.
6. Action on business reported from the Council.
7. Reports of Committees.
8. Miscellaneous business.
9. Presentation and discussion of scientific papers, or remarks.
10. Reading and correction of the minutes of the day's session.
11. Adjournment.

III. The business portion of each day's session shall be open to Fellows and Members only.

IV. The Rules of Order of the Union shall be those of the United States Senate, unless suspended by unanimous consent.

V. The order of business at any session of the Union may be varied from the above, by a two-thirds vote of the Fellows and Members present.

VI. The claims and qualifications of nominees for membership may be discussed before the Union, but such discussions shall be held as strictly confidential.

VII. There shall be a Committee on Publications, consisting of the President, Secretary, Treasurer, Editor, and Assistant Editor, who shall have charge of the printing of the Union, under the direction of the Council.

VIII. A Committee on Communications consisting of three Fellows or Members shall be appointed by the President each year, which shall receive from the Secretary all papers sent to him, from which said Committee shall select those to be read at the next Stated Meeting.

IX. The publication of the quarterly journal, 'The Auk,' shall be in charge of the Council, which, at each Stated Meeting of the Union, shall appoint the editorial staff for the ensuing year, and shall authorize the editorial staff to secure a competent publisher, and otherwise provide for the proper publication of the journal.

X. Any of the above Rules may be amended, suspended, or repealed, on the written motion of two Fellows or Members signed by them, and presented at a Stated Meeting of the Union, in case the same shall be approved by a two-thirds vote of the Fellows and Members present.

CERTIFICATE OF INCORPORATION

OF THE

AMERICAN ORNITHOLOGISTS' UNION

THIS IS TO CERTIFY that we whose names are hereto subscribed, citizens of the United States, and a majority of whom are citizens of the District of Columbia, have associated ourselves together, pursuant to the provisions of Section 545 to 552 inclusive of the Revised Statutes of the United States relative to the District of Columbia, and under an Act to amend the Revised Statutes of the United States, approved April 23, 1884 (23d Statutes at Large, p. 13), as an Association and body corporate, to be known by the corporate name of THE AMERICAN ORNITHOLOGISTS' UNION, for the term of ninety-nine years.

The particular objects and business of this Association are the advancement of its members in Ornithological Science; the publication of a journal of Ornithology and other works relating to that science; the acquisition of a library; and the care and collection of materials relating to the above objects, under the restrictions and regulations established in its By-Laws.

The affairs, funds, and property of the corporation shall be in the general charge of a Board of Management, the number of whose members for the first year shall be twelve, consisting of a President, two Vice-Presidents, a Secretary, a Treasurer, and seven other members, styled Councilors, all of whom shall be chosen by ballot from among the members, at the annual meeting. The duties of these officers, and of other officers and standing committees, and the terms and manner of their election or appointment, shall be provided for in the By-Laws.

WITNESS OUR HANDS AND SEALS, this fourteenth day of November, Eighteen hundred and eighty-eight:

ROBERT RIDGWAY (Seal) C. HART MERRIAM (Seal)
HENRY W. HENSHAW (Seal) LEONHARD STEJNEGER (Seal)
ALBERT K. FISHER (Seal)

Witness to all signatures
JNO. D. MCCHESNEY

DISTRICT OF COLUMBIA, SS:

I, John D. McChesney, a Notary Public in and for the District aforesaid, DO HEREBY CERTIFY That Robert Ridgway, Henry W. Henshaw, C. Hart Merriam, Leonhard Stejneger, and Albert K. Fisher, parties to a certain

Certificate of Incorporation bearing date on the fourteenth day of November, A. D. 1888, and hereunto annexed, personally appeared before me, in the District aforesaid, the said Robert Ridgway, Henry W. Henshaw, C. Hart Merriam, Leonhard Stejneger, and Albert K. Fisher being personally well known to me to be the persons who executed the said Certificate, and acknowledged the same to be their act and deed.

Given under my hand and
notarial seal, this 14th day of
November, A. D. 1888.

JNO. D. MCCHESNEY,
(Seal) *Notary Public.*

OFFICE OF THE RECORDER OF DEEDS,
DISTRICT OF COLUMBIA.

Received for Record Nov. 15, 1888, at 10.41 A. M.
Recorded in Liber No. 4, folio 382, Act of Incorporation Dist. of Col.
Examined by

JAS. M. TROTTER,
Recorder.

OFFICERS AND COMMITTEES OF THE AMERICAN ORNITHOLOGISTS' UNION, 1938

	Expiration of term
FRIEDMANN, HERBERT, *President*	October, 1938
CHAPIN, JAMES P. } *Vice-Presidents*	" 1938
PETERS, JAMES L. }	
HICKS, LAWRENCE E., *Secretary*	" 1938
MCATEE, WALDO L., *Treasurer*	" 1938

ADDITIONAL MEMBERS OF THE COUNCIL

OBERHOLSER, HARRY C.	1938
ROBERTS, THOMAS S.	1938
TAVERNER, PERCY A.	1938
ALLEN, ARTHUR A.	1939
OSGOOD, WILFRED H.	1939
VAN TYNE, JOSSELYN	1939
LLOYD, HOYES	1940
MURPHY, ROBERT C.	1940
PALMER, THEODORE S.	1940

BATCHELDER, CHARLES F., 1905–08
BENT, ARTHUR C. 1935–37
CHAPMAN, FRANK M., 1911–14
FISHER, ALBERT K., 1914–17
FLEMING, JAMES H., 1932–35
GRINNELL, JOSEPH, 1929–32
MERRIAM, C. HART, 1900–03
STONE, WITMER, 1920–23
WETMORE, ALEXANDER, 1926–29
} *Ex-Presidents*

EDITORIAL STAFF OF 'THE AUK'

ALLEN, GLOVER M., *Editor* — October, 1938

COMMITTEES

Committee of Arrangements for the Meeting of 1938

FRIEDMANN, HERBERT, *Chairman*

Committee on Biography and Bibliography

PALMER, T. S., *Chairman*
CHRISTY, B. H.
KNAPPEN, MISS P. M.
WING, L. W.

Committee on Bird Protection

VOGT, WM., *Chairman*

Committee on Classification and Nomenclature of North American Birds

WETMORE, ALEXANDER, *Chairman*

Committee on Publications

ALLEN, G. M., *Chairman*
FRIEDMANN, HERBERT
HICKS, L. E.
MCATEE, W. L.

Committee of Arrangements for the Meeting of 1939

MILLER, A. H., *Chairman*

PATRONS, FELLOWS, MEMBERS, AND ASSOCIATES OF THE AMERICAN ORNITHOLOGISTS' UNION, APRIL, 1938[1]

Comment on the List of Members

Rumor has it that some of our members, impressed by the length of the Union's directory, have made certain inferences as to income that have led them to become dissatisfied with returns in the way of pagination of 'The Auk.' These impressions surely will be modified if members realize that the list always contains more or less 'padding.' For instance all Emeritus and Honorary Fellows and Honorary Associates (a total of 66) pay no dues. Corresponding Fellows (86 in number) also do not contribute to upkeep of the Union except as individually a small number of them subscribe to 'The Auk.' Padding further results from inclusion in the list, for a variety of reasons, of the names of delinquents, in numbers that have sometimes been very considerable. Efforts have been made to eliminate these, culminating this year in the most drastic step yet taken, namely, culling of practically all of those delinquent for more than a year. Under the By-laws, the dropping of even these recent delinquents seems to be warranted but that action has been deemed inexpedient.

Omission of names from this printed list does not mean that the persons concerned have been dropped from the Union. Dues are received at all times of the year but compilation of the directory must stop at some definite date. A member may be restored to good standing the day after the list goes to press but the fact cannot then be recorded in print. The Treasurer's card-file is the real roster of the Union and that officer is authorized to restore to the roll to original date regularly elected members of any class upon payment of back dues.

The printed list, therefore, should not be taken too seriously, either as a record of the standing of individuals or of the number of paid-up members of the Union. To make the latter consideration clear, the Treasurer desires to state that as of March 15, 1938, the number of paid-up members of all classes was 1,268 and of subscribers 145. At the same date the number of 'Auks' sent gratis to honorary members and exchanges was 109. The list augments through the year and reaches its maximum at the time of the annual meeting (usually October or November) when a large number of new associates is elected. For many years that number has run from 200 to 300. Nevertheless this apparent gain is offset by losses so that increase in membership in the Union has been very gradual. The financial depression reduced receipts from dues and subscriptions to below the 1921 level and only in the past year did they reattain the level of 1930. The Sisyphean nature of the task of finding 200 to 300 new members when an equal number are lost each year is something our more permanent membership should recognize. Help in building up the roster is needed and is always much appreciated.

In any event, returning to the theme expressed in the opening sentence, it is apparent that those who have been speculating about a membership of 2,000 and an income from dues in excess of $6,000 have been indulging in fantasies.—W. L. M.

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[1] **By order of the Council names of Members are given in full. Members are requested to advise the Secretary of any errors and to furnish information regarding any names or addresses still incomplete.**

Members of the Union and subscribers to 'The Auk' are requested to notify the Treasurer, W. L. McAtee, 3200 N. 22d St., Arlington, Va., immediately in case of any change of address.

PATRONS

DEANE, MRS. RUTHVEN, 830 Hibbard Road, Winnetka, Ill. 1935
MERRIAM, DR. CLINTON HART, 1919 16th St., N.W., Washington, D. C. (Founder) 1937

FELLOWS

*Life Fellow

	Date of Election
ALLEN, DR. ARTHUR AUGUSTUS, Fernow Hall, Cornell Univ., Ithaca, N. Y.	(1909) 1922[1]
ALLEN, DR. GLOVER MORRILL, Mus. Comp. Zoöl., Cambridge, Mass.	(1896) 1921
BAILEY, MRS. FLORENCE MERRIAM, 1834 Kalorama Road, Washington, D. C.	(1885) 1929
*BALDWIN, DR. SAMUEL PRENTISS, 11025 East Boulevard, Cleveland, O.	(1917) 1934
*BARBOUR, DR. THOMAS, Director Mus. Comp. Zoölogy, Cambridge, Mass.	(1903) 1929
BATCHELDER, CHARLES FOSTER, Peterborough, N. H.	Founder
BEEBE, DR. CHARLES WILLIAM, 33 W. 67th St., New York, N. Y.	(1897) 1912
*BENT, ARTHUR CLEVELAND, 140 High St., Taunton, Mass.	(1889) 1909
*BISHOP, DR. LOUIS BENNETT, 450 Bradford St., Pasadena, Calif.	(1885) 1901
BROOKS, MAJOR ALLAN CYRIL, Okanagan Landing, B. C., Can.	(1902) 1921
CHAPIN, DR. JAMES PAUL, Am. Mus. Nat. Hist., New York, N. Y.	(1906) 1921
CHAPMAN, DR. FRANK MICHLER, Am. Mus. Nat. Hist., New York, N. Y.	(1885) 1888
FISHER, DR. ALBERT KENRICK, The Plymouth, 1236 11th St., N. W., Washington, D. C.	Founder
FLEMING, JAMES HENRY, 267 Rusholme Road, Toronto 4, Ont., Can.	(1893) 1916
FRIEDMANN, DR. HERBERT, U. S. Nat. Mus., Washington, D. C.	(1921) 1929
GRINNELL, DR. GEORGE BIRD, 238 E. 15th St., New York, N. Y.	1883
GRINNELL, DR. JOSEPH, Mus. Vert. Zoöl., Univ. Calif., Berkeley, Calif.	(1894) 1901
GRISCOM, LUDLOW, Mus. Comp. Zoöl., Cambridge, Mass.	(1908) 1925
GROSS, DR. ALFRED OTTO, Bowdoin College, Brunswick, Maine	(1907) 1930
HERRICK, DR. FRANCIS HOBART, 2863 Noble Road, Cleveland, O.	(1913) 1934
HOWELL, ARTHUR HOLMES, 2919 South Dakota Ave., Washington, D. C.	(1889) 1930
JONES, DR. LYNDS, 352 West College St., Oberlin, Ohio	(1888) 1905
KALMBACH, EDWIN RICHARD, 2654 Forest St., Denver, Colo.	(1910) 1927
*LINCOLN, FREDERICK CHARLES, Biol. Survey, Washington, D. C.	(1910) 1934
LLOYD, HOYES, 582 Mariposa Ave., Rockcliffe Park, Ottawa, Can.	(1916) 1932
*MAILLIARD, JOSEPH, 1815 Vallejo St., San Francisco, Calif.	(1895) 1913
MAYR, DR. ERNST [WALTER], Am. Mus. Nat. Hist., New York, N. Y.	(1929) 1937
MCATEE, WALDO LEE, Biological Survey, Washington, D. C.	(1903) 1913
*MERRIAM, DR. CLINTON HART, 1919 16th St., N. W., Washington, D. C.	Founder
MILLER, DR. LOYE HOLMES, Univ. Calif. at Los Angeles, Calif.	(1918) 1930
MURPHY, DR. ROBERT CUSHMAN, Am. Mus. Nat. Hist., New York, N. Y.	(1905) 1920
NICE, MRS. MARGARET MORSE, 5708 Kenwood Ave., Chicago, Ill.	(1920) 1937
*OBERHOLSER, DR. HARRY CHURCH, Biol. Survey, Washington, D. C.	(1888) 1902
OSGOOD, DR. WILFRED HUDSON, Field Mus. Nat. Hist., Chicago, Ill.	(1893) 1905

[1] Date in parenthesis indicates year of joining the Union.

*PALMER, DR. THEODORE SHERMAN, 1939 Biltmore St., N. W., Washington, D. C. ..... (1888) 1901
PETERS, JAMES LEE, Harvard, Mass. ..... (1904) 1927
*PHILLIPS, DR. JOHN CHARLES, Wenham, Mass. ..... (1904) 1925
PREBLE, EDWARD ALEXANDER, 3027 Newark St., N. W., Washington, D. C. ..... (1892) 1935
RILEY, JOSEPH HARVEY, U. S. Nat. Mus., Washington, D. C. ..... (1897) 1919
ROBERTS, DR. THOMAS SADLER, Univ. Minnesota, Minneapolis, Minn. 1883
SAUNDERS, DR. WILLIAM EDWIN, 240 Central Ave., London, Ont., Can. 1883
STODDARD, HERBERT LEE, Sherwood Plantation, Thomasville, Ga. ..... (1912) 1936
*STONE, DR. WITMER, Acad. Nat. Sciences, Philadelphia, Pa. ..... (1885) 1892
SUTTON, GEORGE MIKSCH, Pebble Hearths, Bethany, W. Va. ..... (1910) 1936
TAVERNER, PERCY ALGERNON, National Mus., Ottawa, Ont., Can. ..... (1902) 1917
TODD, WALTER EDMOND CLYDE, Carnegie Mus., Pittsburgh, Pa. ..... (1890) 1916
VAN ROSSEM, ADRIAAN JOSEPH, Calif. Institute Technology, Pasadena, Calif. ..... (1923) 1934
VAN TYNE, DR. JOSSELYN, Mus. Zoöl., Univ. Mich., Ann Arbor, Mich. ..... (1922) 1936
*WETMORE, DR. ALEXANDER, U. S. Nat. Mus., Washington, D. C. ..... (1908) 1919
ZIMMER, JOHN TODD, Am. Mus. Nat. Hist., New York, N. Y. ..... (1908) 1933

FELLOWS EMERITI

ANTHONY, ALFRED WEBSTER, 433 Nutmeg St., San Diego, Calif. ..... (1885) 1934
BROWN, NATHAN CLIFFORD, The Lafayette, Portland, Maine ..... (Founder) 1936
FISHER, PROF. WALTER KENRICK, Hopkins Marine Sta., Pacific Grove, Calif. ..... (1899) 1920
STEJNEGER, DR. LEONHARD, U. S. Nat. Mus., Washington, D. C. ..... (1883) 1911

HONORARY FELLOWS

ARRIGONI DEGLI ODDI, COUNT ETTORE, Univ. of Padua, Padua, Italy ..... (1900) 1930
BAKER, EDWARD CHARLES STUART, 6 Harold Road, Upper Norwood, London, S. E. 19, England ..... (1918) 1920
BUTURLIN, SERGIUS ALEXANDROVICH, c/o Prof. S. I. Ognev, Zoöl. Mus., 1st University, Moscow, U. S. S. R. ..... (1907) 1916
CLARKE, DR. WILLIAM EAGLE, 8 Grosvenor St., Edinburgh, Scotland ..... (1889) 1921
DABBENE, DR. ROBERTO, Calle Corrientes 2988, Buenos Aires, Argentina ..... (1916) 1918
DELACOUR, JEAN THEODORE, Château de Clères, Seine Inférieure, France (1920) 1928
EVANS, DR. ARTHUR HUMBLE, Cheviot House, Crowthorne, Berks, England ..... (1899) 1917
GYLDENSTOLPE, COUNT NILS [CARL GUSTAFFERSEN], Naturhistoriska Riksmuseum, Vetenskapsakademien, Stockholm 50, Sweden ..... (1918) 1934
HAAGNER, ALWIN KARL, Director Jardim Zoöl., Caixa Postal 395, Beira, Portuguese East Africa ..... (1916) 1918
HALL, ROBERT, Tasmanian Museum, Hobart, Tasmania ..... (1916) 1923
HELLMAYR, DR. CARL EDUARD, Naturhist. Mus., Burgring 7, Vienna I, Austria ..... (1903) 1911
JOURDAIN, REV. FRANCIS CHARLES ROBERT, Whitekirk, 4 Belle Vue Road, Southbourne, Bournemouth, England ..... (1918) 1921

KINNEAR, NORMAN BOYD, Brit. Mus. (Nat. Hist.), Cromwell Road, London, S. W. 7, England.....(1931) 1934
KURODA, DR. NAGAMICHI, Fukuyoshi Cho, Akasaka, Tokyo, Japan....(1918) 1921
LÖNNBERG, DR. [AXEL JOHAN] EINAR, Naturhistoriska Riksmuseum, Vetenskapsakademien, Stockholm 50, Sweden.....(1916) 1918
LOWE, DR. PERCY ROYCROFT, Brit. Mus. (Nat. Hist.), Cromwell Road, London, S. W. 7, England.....(1916) 1920
MATHEWS, GREGORY MACALISTER, Meadway, St. Cross, Winchester, Hants, England.....(1911) 1927
MEINERTZHAGEN, COL. RICHARD, 17 Kensington Park Gardens, London, W. 11, England.....(1916) 1928
MENEGAUX, DR. HENRI AUGUSTE, Muséum d'Histoire Naturelle, 55 rue de Buffon, Paris, France.....(1916) 1918
PYCRAFT, WILLIAM PLANE, British Museum (Nat. Hist.), Cromwell Road, London, S. W. 7, England.....(1902) 1911
REICHENOW, DR. ANTON, Moltkestr. 7, Hamburg 30, Germany.....(1884) 1891
SCLATER, WILLIAM LUTLEY, 10 Sloane Court, Chelsea, London, S. W. 3, England.....(1906) 1917
STRESEMANN, DR. ERWIN, Zoöl. Museum, Universität, Invalidenstr. 43, Berlin, N. 4, Germany.....(1922) 1930
WITHERBY, HARRY FORBES, Gracious Pond Farm, Chobham, near Woking, Surrey, England.....(1921) 1928

CORRESPONDING FELLOWS

ALEXANDER, WILFRID BACKHOUSE, Dept. Zoöl., University Museum, Oxford, England.....1921
ALFARO, DON ANASTASIO, San José, Costa Rica.....1888
ASHBY, EDWIN, Wittunga, Blackwood, Adelaide, South Australia.....1918
BANNERMAN, DAVID ARMITAGE, 7 Pembroke Gardens, Kensington, London, W. 8, England.....1916
BATE, MISS DOROTHEA MINOLA ALICE, British Museum (Nat. Hist.), Cromwell Road, London, S. W. 7, England.....1920
BATES, GEORGE LATIMER, Timbuctoo, Blasford Hill, Little Waltham, Chelmsford, England.....1919
BAXTER, MISS EVELYN VIDA, The Grove, Kirkton of Largo, Fifeshire, Scotland.1919
BEAUFORT, DR. LIEVEN FERDINAND DE, Zoöl. Museum, Amsterdam, Holland..1926
BELCHER, SIR CHARLES FREDERIC, K.B.E., 31 Alexander St., Port of Spain, Trinidad, B. W. I.....(1931) 1934
BERLIOZ, JACQUES, Muséum d'Histoire Naturelle, 55 rue de Buffon, Paris, France.....1923
BERTONI, DR. ARNOLDO DE WINKELREID, Puerto Bertoni, Paraguay.....1919
BRINDLEY, MRS. HAROLD HULME, 25 Madingley Road, Cambridge, England..1920
CHASEN, FREDERICK NUTTEN, Raffles Museum, Singapore, Straits Settlements.1934
CHIGI, PRINCE D. FRANCESCO, Castel Fusano, Rome, Italy.....1932
CHISHOLM, ALEXANDER HUGH, Daily Telegraph, Sydney, N. S. W.....1922
COLLIN, ALBERT, Hovinmaa, Finland.....(1928) 1931
COLLINGE, DR. WALTER EDWARD, The Yorkshire Museum, York, England....1918
CONTRERAS, MARCEL HENRI FELIX DE, 52 Place Georges Brugmann, Brussels, Belgium.....1923

CSORGEY, TITUS, Director Roy. Hungarian Inst. Ornithology, Herman Otto-ut 15, Budapest II, Hungary....1932
DE LAVALLE, JOSÉ ANTONIO, Lima, Peru....1925
DEMENTIEV, GEORGES, Zoöl. Museum, Moscow Govt. University, Moscow 9, U. S. S. R....1934
DOMANIEWSKI, JANUSZ WITOLD, Polish Zoöl. Museum, Krakowskie-Przedmiescie 26, Warsaw, Poland....1926
DROST, PROF. DR. RUDOLF, Heligoland, Germany....1934
DUPOND, CHARLES, Square Prince Charles 21, Bruxelles-Laeken, Belgium....1932
FALLA, R. A., Christchurch, N. Z....1937
FERRARI-PEREZ, PROF. FERNANDO, Tacubaya, D. F., Mexico....1885
GEE, NATHANIEL GIST, Greenwood, S. C....1919
GHIGI, PROF. ALESSANDRO, R. Università, Bologna, Italy....1921
GLADSTONE, CAPT. HUGH STEUART, Penpont, Dumfries, England....1923
GRANT, CAPT. CLAUDE HENRY BAXTER, 58A Ennismore Gardens, London, S. W. 7, England....1920
GROEBBELS, DR. FRANZ, Physiol. Institut Krankenhaus, Hamburg Eggendorf, Germany....1933
GROTE, HERMAN, Treudelenburgstrasse 16, Berlin-Charlottenburg, Germany..1923
HACHISUKA, THE MARQUESS, Mita Shiba, Tokyo, Japan....(1927) 1930
HEINROTH, DR. OSKAR A., Director Aquarium, Berlin, Germany....1932
HELMS, DR. OTTO, Sanatoriet ved Nakkelböllefjord, pres Pejruk, Denmark....1920
HENNICKE, DR. CARL RICHARD, Gera, Reuss, Germany....1907
HENSON, HARRY VERNON, c/o Hong Kong and Shanghai Banking Corp., 9 Grace Church St., London, E. C., England....1888
HORTLING, DR. IVAR JOHANNES, Helsingfors-Brandö, Finland....1926
HOWARD, HENRY ELIOT, Clarelands, near Stourport, Worcestershire, England..1930
HULL, ARTHUR FRANCIS BASSET, Box 704, Sydney, New South Wales....1919
INGRAM, CAPT. COLLINGWOOD, The Grange, Benenden, Cranbrook, Kent, England....1920
IREDALE, TOM, c/o Australian Museum, Sydney, New South Wales....1918
KLOSS, CECIL BODEN, Royal Societies Club, 63 St. James' St., London, S. W. 1, England....1918
LAUBMANN, DR. ALFRED, Zoöl. Staatssammlung, Neuhauser-str. 51, Munich, Germany....1923
LODGE, GEORGE EDWARD, Hawkhouse, Park Road, Camberley, Surrey, England.1921
LUCANUS, FRIEDRICH CARL HERMANN VON, Invalidenstrasse 43, Berlin, N. 4, Germany....1923
LYNES, REAR-ADMIRAL HUBERT, R. N., 169 Cranmer Court, Sloane Ave., London, S. W. 3, England....1930
MARIA, HERMANO APOLINAR, Instituto de la Salle, Bogota, Colombia....1921
MATTINGLEY, ARTHUR HERBERT EVELYN, 42 Canterbury Road, Camberwell, Melbourne, Australia....1921
MITCHELL, SIR PETER CHALMERS, Zoölogical Society, Regent's Park, London, N. W. 8, England....1919
MOFFETT, LACY IRVINE, Kiangyin Ku, China....1919
MOLTONI, DR. EDGARDO, Milan, Italy....1936
MOMIYAMA, TOKU TARO, 1146 Sasazka, Yoyohata-mati, Tokyo, Japan....1925
NEUMANN, PROF. OSCAR, Wilmersdorferstrasse 74, Berlin-Charlottenburg III, Germany....1928

OLIVER, DR. WALTER REGINALD BROOK, 26 Ventnor St., Seatown, Wellington, E 5, N. Z.....1923
PALMGREN, DR. PONTUS, Zoöl. Mus., Lönnrotgatan 19, Helsingfors, Finland (1932) 1933
PATEFF, DR. PAWEL, Director Zoöl. Gardens, Sofia, Bulgaria.....1934
PHILLIPS, MONTAGU AUSTIN, 57 St. George's Sq., London, S. W. 1, England....1919
PONCY, PROF. ROBERT, Lachenal 19, Geneva, Switzerland.....1932
RAMSDEN, DR. CHARLES THEODORE, 8 y 19 Vista Alegre, Santiago, Cuba. (1912) 1918
RENSCH, BERNHARD, Zoöl. Mus., Invalidenstr. 43, Berlin 4, Germany.....1932
RIBEIRO, DR. ALIPIO DE MIRANDA, National Museum, Rio Janeiro, Brazil....1921
RINTOUL, MISS LEONORA JEFFREY, Lahill, Largo, Fifeshire, Scotland.....1919
ROBERTS, AUSTIN, Transvaal Museum, Pretoria, Transvaal, South Africa.....1920
SASSI, DR. MORIZ, Naturhist. Museum, Burgring 7, Vienna I, Austria.....1934
SCHAANNING, HANS THOMAS LANGE, Stavanger Museum, Stavanger, Norway..1923
SCHENK, JAMES, Secy. Roy. Hungarian Inst. Ornith., Herman Otto-ut 15, Budapest II, Hungary.....1926
SCHOUTEDEN, DR. H., Director Musée Congo Belge, Tervueren, Belgium.....1934
SETH-SMITH, DAVID, Zoölogical Gardens, Regent's Park, London, N. W. 8, England.....1920
SKOVGAARD, PETER, Skovbo, pres Viborg, Denmark.....1926
STEGMANN, BORIS CHARLES, Zoöl. Mus., Acad. Sci., Leningrad, U. S. S. R.....1932
STEINBACHER, DR. FRIEDRICH, Waldowstr. 19, Berlin-Friedrickshagen, Germany 1934
STONEHAM, LIEUT.-COL. HUGH FREDERIC, Parknasilla, East Surrey Coffee Estates, Kitale, Kenya Colony, British East Africa.....(1928) 1930
SWYNNERTON, CHARLES FRANCIS MASSY, Poste Restante, Dar-es-Salaam, Tanganyika Ter., East Africa.....1918
TAKA-TSUKASA, PRINCE NOBUSUKA, 1732 Sanchome, Kami-meguro, Meguro-ku, Tokyo, Japan.....1924
THEEL, DR. JOHAN HJALMAR, Appleviken, Rodluvan 7, Stockholm, Sweden...1884
THIENEMANN, DR. JOHANNES, Rossitten, Kurische Nehrung, Germany.....1926
THOMSON, DR. ARTHUR LANDSBOROUGH, 16 Tregunter Road, London, S. W. 10, England.....1922
TICEHURST, DR. CLAUD BUCHANAN, Saxon House, Appledore, Kent, England..1922
TICEHURST, NORMAN FREDERIC, 24 Pevensey Road, St. Leonards-on-Sea, Sussex, England.....1918
TURNER, MISS EMMA LOUISA, 13 Storey's Way, Cambridge, England.....1920
UCHIDA, DR. SEINOSUKE, No. 1, 7-chome, Aoyama, Kitamachi, Tokyo, Japan..1919
VAN SOMEREN, DR. VICTOR GURNET LOGAN, Box 658, Nairobi, Kenya Colony, British East Africa.....1921
WAIT, WALTER ERNEST, Applegarth, Aldbury, near Tring, Herts., England....1925
WHISTLER, HUGH, Calbec House, Battle, Sussex, England.....1921
WHITE, CAPT. SAMUEL ALBERT, Wetunga, Fulham, South Australia.....1919

MEMBERS

*Life Member

ABBOTT, CLINTON GILBERT, Nat. Hist. Mus., Balboa Park, San Diego, Calif. (1898) 1931
ALLEN, FRANCIS HENRY, 215 La Grange St., West Roxbury, Mass.....(1888) 1901
ANDERSON, DR. RUDOLPH MARTIN, Nat. Mus., Ottawa, Can.....(1907) 1914

AUSTIN, DR. OLIVER LUTHER, JR., Wellfleet, Cape Cod, Mass. . . . . (1925) 1931
BAILEY, ALFRED MARSHALL, Colorado Museum, Denver, Colo. . . . . (1918) 1930
BAILEY, VERNON [ORLANDO], 1834 Kalorama Road, Washington, D. C. (1887) 1901
BAILLIE, JAMES LITTLE, JR., Royal Ontario Mus., Toronto 5, Ont. . . . . (1923) 1935
BAILY, WILLIAM LLOYD, 220 E. Lancaster Road, Ardmore, Pa. . . . . (1886) 1901
BARTSCH, DR. PAUL, U. S. Nat. Mus., Washington, D. C. . . . . (1896) 1902
BECK, ROLLO HOWARD, Planada, Merced Co., Calif. . . . . (1894) 1917
BOND, FRANK, 3127 Newark St., N. W., Washington, D. C. . . . . (1887) 1901
BOND, JAMES, Acad. Nat. Sci., Philadelphia, Pa. . . . . (1923) 1929
BOULTON, WOLFRID RUDYERD, Field Museum, Chicago, Ill. . . . . (1915) 1929
BOWDISH, BEECHER SCOVILLE, Demarest, N. J. . . . . (1891) 1934
BOWEN, WILFRID WEDGWOOD, Dartmouth College Mus., Hanover, N. H. (1926) 1931
BRAISLIN, DR. WILLIAM COUGHLIN, 425 Clinton Ave., Brooklyn, N. Y. . . (1894) 1902
*BRAND, ALBERT RICH, 9 East Ave., Ithaca, N. Y. . . . . (1929) 1935
BRECKENRIDGE, WALTER JOHN, Mus. Nat. Hist., Univ. Minnesota, Minneapolis, Minn. . . . . (1926) 1935
BRIMLEY, HERBERT HUTCHINSON, State Museum, Raleigh, N. C. . . . . (1904) 1934
BRODKORB, WILLIAM PIERCE, Mus. Zool. Univ. Mich., Ann Arbor, Mich. (1925) 1937
BROOKS, WINTHROP SPRAGUE, Orleans, Mass. . . . . (1907) 1917
BRYANT, DR. HAROLD CHILD, 2907 Rittenhouse St., N. W., Washington, D. C. . . . . (1913) 1918
BUNKER, CHARLES DEAN, Kansas Univ. Mus., Lawrence, Kans. . . . . (1916) 1923
BURLEIGH, THOMAS DEARBORN, Route I, Oakhurst, Gulfport, Miss. . . . (1913) 1932
BURNS, FRANKLIN LORENZO, Berwyn, Pa. . . . . (1891) 1901
BURTCH, VERDI, Branchport, N. Y. . . . . (1903) 1934
CARRIKER, MELBOURNE ARMSTRONG, JR., Beach Ave. and Wave St., Beechwood, N. J. . . . . (1907) 1933
*CHAMBERS, WILLIE LEE, 2068 Escarpa Drive, Eagle Rock, Los Angeles, Calif. . . . . (1907) 1913
CHERRIE, GEORGE KRUCK, Newfane, Vt. . . . . (1891–1912) (1917) 1918
*CHRISTY, BAYARD HENDERSON, 403 Frederick Ave., Sewickley, Pa. . . . . (1922) 1931
CLARK, DR. HUBERT LYMAN, Mus. Comp. Zoöl., Cambridge, Mass. . . . . (1886) 1902
COLE, DR. LEON JACOB, Dept. Genetics, Univ. Wis., Madison, Wis. . . . (1908) 1934
*CONOVER, HENRY BOARDMAN, 6 Scott St., Chicago, Ill. . . . . (1920) 1930
*COOKE, MISS MAY THACHER, 1400 Fairmont St., N. W., Washington, D. C. . . . . (1915) 1926
COTTAM, CLARENCE, Biol. Survey, Dept. Agr., Washington, D. C. . . . . (1928) 1934
CRANDALL, LEE SAUNDERS, Zoölogical Park, New York, N. Y. . . . . (1909) 1930
DANFORTH, STUART TAYLOR, Box 541, Mayaguez, P. R. . . . . (1916) 1933
DAVIDSON, MRS. MARY ELLA MCLELLAN, c/o W. J. Wright, Boquete, Chiriqui Province, Panama . . . . . (1920) 1932
DE SCHAUENSEE, RODOLPHE MEYER, Devon, Pa. . . . . (1925) 1933
*DIXON, JOSEPH SCATTERGOOD, Mus. Vert. Zoöl., Univ. Calif., Berkeley, Calif. . . . . (1917) 1923
EIFRIG, PROF. CHARLES WILLIAM GUSTAVE, 1029 Monroe Ave., River Forest, Ill. . . . . (1901) 1929
ERRINGTON, PAUL LESTER, Insectary, Iowa State College, Ames, Iowa . . (1932) 1936
FINLEY, WILLIAM LOVELL, R. F. D. 10, Box 426A, Portland, Oregon . . . . (1904) 1907
FORD, EDWARD RUSSELL, Chicago Academy Sciences, Chicago, Ill. . . . . (1920) 1936
GABRIELSON, IRA NOEL, 1708 N. Harvard St., Arlington, Va. . . . . (1912) 1920

GANIER, ALBERT FRANKLIN, 2507 Ashwood Ave., Nashville, Tenn.....(1917) 1934
GAULT, BENJAMIN TRUE, Health Home, Wheaton, Ill.....(1885) 1903
GOLDMAN, EDWARD ALPHONSO, Biol. Survey, Washington, D. C.....(1897) 1902
GREENWAY, JAMES COWAN, JR., Mus. Comp. Zoöl., Cambridge, Mass...(1930) 1933
GREGORY, STEPHEN STRONG, JR., Box N, Winnetka, Ill.....(1906) 1934
HARPER, DR. FRANCIS, 224 S. Chester Rd., Swarthmore, Pa.....(1907) 1917
*HARRIS, HARRY, 5234 Hermosa Ave., Eagle Rock, Los Angeles, Calif...(1911) 1919
HERSEY, FRANK SEYMOUR, Bay Road, Easton, Mass.....(1911) 1916
*HICKS, LAWRENCE EMERSON, Botany Dept., Ohio State Univ., Columbus, Ohio.....(1929) 1936
HOLT, ERNEST GOLSAN, Boulevard Apts., 2121 N. Y. Ave., N.W., Washington, D. C.....(1911) 1925
HOWARD, DR. HILDEGARDE, Los Angeles Museum, Exposition Park, Los Angeles, Calif.....(1928) 1935
*HOWELL, ALFRED BRAZIER, Dept. Anatomy, Johns Hopkins Medical School, Baltimore, Md.....(1909) 1916
HUBER, WHARTON, 225 St. Marks Sq., Philadelphia, Pa.....(1915) 1922
HUEY, LAURENCE MARKHAM, Nat. Hist. Mus., Balboa Park, San Diego, Calif.....(1920) 1932
JACOBS, JOSEPH WARREN, 404 S. Washington St., Waynesburg, Pa.....(1889) 1904
JAQUES, FRANCIS LEE, Am. Mus. Nat. Hist., New York, N. Y.....(1924) 1934
JEFFRIES, WILLIAM AUGUSTUS, 50 Congress St., Boston, Mass.....(1883) 1901
JEWETT, STANLEY GORDON, 404 U. S. Court House, Portland, Oregon .(1906) 1926
*KENDEIGH, DR. SAMUEL CHARLES, Expt. Zoöl. Lab., University Illinois, Champaign, Ill.....(1923) 1932
LEOPOLD, PROF. ALDO, Old Entomological Bldg., 1532 University Ave., Madison, Wis.....(1929) 1935
LEWIS, DR. HARRISON FLINT, Nat. Parks Bureau, Dept. Mines and Resources, Ottawa, Can.....(1912) 1930
LIGON, JAMES STOKLEY, Carlsbad, N. Mex.....(1912) 1927
LINSDALE, DR. JEAN MYRON, Mus. Vert. Zoöl., Univ. Calif., Berkeley, Calif.....(1922) 1933
*LYON, WILLIAM ISAAC, 124 Washington St., Waukegan, Ill.....(1921) 1925
MAY, DR. JOHN BICHARD, South Main St., Cohasset, Mass.....(1916) 1930
MILLER, DR. ALDEN HOLMES, Mus. Vert. Zoöl., Univ. Calif., Berkeley, Calif.....(1929) 1933
MOFFITT, JAMES, 1879 Broadway, San Francisco, Calif.....(1926) 1937
MOORE, ROBERT THOMAS, R. R. No. 1, Box 28A, Pasadena, Calif.....(1898) 1914
MOUSLEY, WILLIAM HENRY, 4073 Tupper St., Westmount, Montreal, Can. (1915) 1926
MUNRO, JAMES ALEXANDER, Okanagan Landing, B. C., Can.....(1913) 1926
MURIE, OLAUS JOHAN, Jackson, Wyo.....(1913) 1934
MURRAY, REV. JOSEPH JAMES, D.D., 6 White St., Lexington, Va.....(1928) 1936
*NAUMBURG, MRS. WALTER WEHLE, 121 E. 64th St., New York, N. Y...(1916) 1924
NICHOLS, JOHN TREADWELL, Am. Mus. Nat. Hist., New York, N. Y...(1901) 1910
NORTON, ARTHUR HERBERT, Mus. Nat. Hist., 22 Elm St., Portland, Maine.....(1890) 1902
PEARSON, DR. THOMAS GILBERT, 2257 Loring Place, New York, N. Y...(1891) 1902
PETERSON, ROGER TORY, 22 E. 89th St., New York, N. Y.....(1929) 1935
PETTINGILL, DR. OLIN SEWALL, JR., Dept. Zool., Carleton College, Northfield, Minn.....(1930) 1937

PIRNIE, MILES DAVID, Kellogg Bird Sanctuary, R.F.D. 1, Augusta, Mich. ..... (1919) 1937
RATHBUN, SAMUEL FREDERICK, Apt. 105, 906 Summit Ave., Seattle, Wash. (1893) 1902
*RIVES, DR. WILLIAM CABELL, 1702 Rhode Island Ave., Washington, D. C. ..... (1885) 1901
*ROGERS, CHARLES HENRY, East Guyot Hall, Princeton, N. J. ..... (1904) 1921
ROWAN, PROF. WILLIAM, Univ. Alberta, Edmonton, Alta., Can. ..... (1920) 1927
SAUNDERS, ARETAS ANDREWS, 48 Longview Ave., Fairfield, Conn. ..... (1907) 1920
SAVAGE, JAMES, 1048 Ellicott Sq., Buffalo, N. Y. ..... (1895) 1934
SETON, ERNEST THOMPSON, Box 830, Santa Fé, N. Mex. ..... (1883) 1901
SHAVER, DR. JESSE MILTON, Peabody College, Nashville, Tenn. ..... (1924) 1932
*SHERMAN, MISS ALTHEA ROSINA, National, via McGregor, Iowa ..... (1907) 1912
*SHIRAS, HON. GEORGE, 3D, 4530 Klingle St., Wesley Heights, Washington, D. C. ..... (1907) 1915
SIMMONS, GEORGE FINLAY, 2903 Edgehill Road, Cleveland Heights, Ohio (1910) 1923
SMITH, WENDELL PHILLIPS, Wells River, Vt. ..... (1919) 1937
SNYDER, LESTER LYNNE, Royal Ont. Mus., Toronto 5, Ont., Can. ..... (1919) 1929
SOPER, JOSEPH DEWEY, 827 Riverwood Ave., Fort Garry, Winnipeg, Man. (1918) 1933
SPRUNT, ALEXANDER, JR., R. F. D. 1, Charleston, S. C. ..... (1923) 1928
STEPHENS, PROF. THOMAS CALDERWOOD, Morningside College, Sioux City, Iowa ..... (1909) 1920
STONER, DR. DAYTON, N. Y. State Museum, Albany, N. Y. ..... (1922) 1935
STORER, DR. TRACY IRWIN, Div. Zoöl., Univ. Calif., Davis, Calif. ..... (1916) 1922
STREET, JOHN FLETCHER, 1120 Locust St., Philadelphia, Pa. ..... (1908) 1928
STRONG, DR. REUBEN MYRON, 5840 Stoney Island Ave., Hyde Park Sta., Chicago, Ill. ..... (1889) 1903
*STUART, GEORGE HAY, 3D, Broughton Lane, Villa Nova, Pa. ..... (1913) 1928
SWENK, MYRON HARMON, 1410 N. 37th St., Lincoln, Nebr. ..... (1904) 1920
TOWNSEND, DR. CHARLES HASKINS, Orienta Point, Mamaroneck, N. Y. (1883) 1901
*TYLER, DR. WINSOR MARRETT, 112 Pinckney St., Boston, Mass. ..... (1912) 1917
UHLER, FRANCIS MOREY, Biol. Survey, Dept. Agr., Washington, D. C. ..... (1924) 1937
URNER, CHARLES ANDERSON, 596 Westminster Ave., Elizabeth, N. J. ..... (1920) 1933
VOGT, WILLIAM, 609 W. 114th St., New York, N. Y. ..... (1928) 1936
WARREN, EDWARD ROYAL, 1511 Wood Ave., Colorado Springs, Colo. ..... (1902) 1910
WESTON, FRANCIS MARION, U. S. Naval Air Station, Pensacola, Fla. ..... (1925) 1933
WHITE, FRANCIS BEACH, St. Paul's School, Concord, N. H. ..... (1891) 1925
WILLETT, GEORGE, Los Angeles Museum, Exposition Park, Los Angeles, Calif. ..... (1912) 1913
*WILLIAMS, ROBERT WHITE, Biol. Survey, Washington, D. C. ..... (1900) 1918
*WOOD, DR. CASEY ALBERT, 7 W. Madison St., Chicago, Ill. ..... (1917) 1921
WOOD, NORMAN ASA, Zool. Mus. Univ. Mich., Ann Arbor, Mich. ..... (1904) 1912
WRIGHT, DR. ALBERT HAZEN, Upland Road, Ithaca, N. Y. ..... (1906) 1919
WYNNE-EDWARDS, PROF. VERO COPNER, McGill Univ., Montreal, Can. ..... (1930) 1936

ASSOCIATES

*Life Associate **Honorary Life Associate

ABBOTT, CYRIL EDWARD, 78 E. Woodruff St., Columbus, Ohio....1934
ABBOTT, MISS HARRIET, P. O. Box 244, Fryeburg, Maine....1918
*ACHILLES, MRS. GERTRUDE STRONG, Morgan Hill, Calif....1925
ACWORTH, CAPT. BERNARD, R.N., 24 Essex St., Strand, London, England....1933
ADAMS, BENJAMIN, 25 Garden St., Wethersfield, Conn....1911
ADAMS, DR. CHARLES EVERETT, 29 W. Broadway, Bangor, Maine....1922
ADAMS, WILLIAM CLARK, Fish & Game Div., Dept. Conservation, State Office Bldg., Albany, N. Y....1920
ADAMS, DR. ZABDIEL BOYLSTON, 43 Cottage Farm Road, Brookline, Mass....1908
ADELSON, RICHARD HENRY, 3348 167th St., Flushing, N. Y....1937
AHERN, GEORGE STUART, 8 St. Denis Ave., Quebec, Que., Can....1931
AHRENS, DR. THEODOR GEORGE, rue des Eaux Vives, 69, Geneva, Switzerland....1920
ALDRICH, DR. JOHN WARREN, Cleveland Mus. Nat. Hist., 2717 Euclid Ave., Cleveland, Ohio....1929
*ALEXANDER, MISS ANNIE MONTAGUE, Box 248, Suisun City, Calif....1911
ALEXANDER, DONALD CHILD, 18 Hurd St., Lowell, Mass....1936
ALEXANDER, FRANK MCDANIEL, Box 95, Wellington, Kans....1933
ALEXANDER, KENNETH FREDERICK COCHRANE, Hope Point, Long Bay, Gambier Id., B. C., Can....1937
ALLAN, PHILIP FARLEY, c/o Soil Conservation Service, Amarillo, Texas....1931
ALLARD, HARRY ARDELL, 425 West Wing, Dept. Agr., Washington, D. C....1929
ALLEN, MRS. ARTHUR AUGUSTUS, 208 Kline Road, Ithaca, N. Y....1935
ALLEN, MRS. AMELIA SANBORN, 37 Mosswood Road, Berkeley, Calif....1919
ALLEN, ARTHUR FRANCIS, 108 Terrace Apts., Sioux City, Iowa....1919
ALLEN, DURWARD LEON, 2609 Florida Drive, Fort Wayne, Ind....1931
ALLEN, ROBERT PORTER, Nat. Assn. Audubon Soc., 1775 Broadway, New York, N. Y....1933
ALLEN, ROBERT W., Ossian, Iowa....1937
ALLEN, WALTER FOX, 11 Thurmont Rd., Caldwell, N. J....1925
ALLERT, OSCAR PAUL, R. D. 1, McGregor, Iowa....1923
ALLISON, WM. HENRY, 20 Leroy St., Potsdam, N. Y....1935
ALLYN, RICHARD, 50 Haven Ave., New York, N. Y....1937
AMADON, DEAN, 356 W. 34th St., New York, N. Y....1930
AMMANN, GEORGE ANDREW, 273 Rockaway Ave., Boonton, N. J....1933
ANDREWS, ARTHUR ALLEN, 362 Augustine St., Rochester, N. Y....1924
ANGELL, WALTER ALLEN, 33 Westminster St., Providence, R. I....1901
ANGUS, HENRY LEE, 1327 Spring St., Quincy, Ill....1936
ANTHES, CLARENCE ALVIN, 713 Hamilton Ave., Waukesha, Wis....1937
APPLEGATE, WILSON G. HUNT, Rhinebeck, N. Y....1934
APPLETON, HENRY LEWIS, Twin Spring Farm, Penllyn, Pa....1929
ARCHBOLD, RICHARD, Am. Mus. Nat. Hist., New York, N. Y....1930
ARCHIBALD, MRS. W. P., Route 1, Box 458, Santa Cruz, Calif....1930
ARMSTRONG, MISS VIRGINIA, Musketaquid Road, Concord, Mass....1937
ARNOLD, MISS CORDELIA H., 17 No. Hanover Ave., Atlantic City, N. J....1936
*ARNOLD, EDWARD WILLIAM CAMERON, Box 909, Punta Gorda, Fla....1929
ARNOLD, ELTING, 300 W. 12th St., New York, N. Y....1934

ARNOLD, JOHN RONALD, 204 Delaware St., Ithaca, N. Y. 1936
ARNOLD, MRS. MARY HAZEN, Haddam, Conn. 1936
ARNOTT, HENRY GRAHAM, R. R. 2, Freeman, Ont., Canada 1935
ARTHUR, PAUL HAMILTON, West 231st St., Spuyten Duyvil, New York, N. Y. 1933
ASCHEMEIER, CHARLES ROBERT, U. S. Nat. Mus., Washington, D. C. 1931
ASTLEY, ARTHUR, Freshfield, Ambleside, England 1928
ATWELL, GEORGE C., Strafford, N. H. 1936
AUSTIN, DR. OLIVER LUTHER, Tuckahoe, Westchester Co., N. Y. 1930
AVERBACH, BERTRAM FREDERICK, 2173 Cummington Rd., Cleveland, Ohio 1924
AXTELL, HAROLD HAMILTON, 18 James St., Cortland, N. Y. 1937
AYLMER, CAPT. EDWARD ARTHUR, R.N., Poynings, Uffenline, Devon, England 1935
AYER, MRS. [NATHAN] EDWARD, 1300 Hillcrest Drive, Pomona, Calif. 1924
BABCOCK, MISS MYRTLE EVERTS, 655 Merrick Ave., Detroit, Mich. 1931
BACON, FRANCIS LLEWELLYN, 22 Waterman Ave., Chestnut Hill, Philadelphia, Pa. 1917
BAERG, PROF. WILLIAM J., Exp. Sta., Univ. Ark., Fayetteville, Ark. 1924
*BAGG, AARON CLARK, 72 Fairfield Ave., Holyoke, Mass. 1916
BAILEY, GEORGE JARBEAU, Walden, Colo. 1930
BAILEY, JOHN WENDELL, University, Richmond, Va. 1925
BAILEY, W. W., Zoöl. Dept., Blacksburg, Va. 1936
BAIRD, DONALD CREIGHTON, JR., Maple Lane, Shields, Pa. 1935
BAKER, JOHN HOPKINSON, 1165 Fifth Ave., New York, N. Y. 1911
BAKER, WILLIAM CALVIN, 223 West Pershing St., Salem, Ohio 1930
BALDWIN, MRS. HARRY LEVERETT, 6335 Kimbark Ave., Chicago, Ill. 1924
BALDWIN, WILLIAM PLEWS, JR., 408 W. 26th St., Wilmington, Del. 1937
BALL, WILLIAM HOWARD, 1861 Ingleside Terrace, N. W., Washington, D. C. 1923
BALLARD, MRS. ROSAMOND LOCKETT, Avery Island, La. 1937
BANFIELD, FRANK ALEXANDER, 932a Avenue Road, Toronto, Ont., Canada 1935
BARBER, PROF. BERTRAM ALPHA, 350 West St. North, Hillsdale, Mich. 1920
BARBER, GEORGE W., 56 Hillhouse Ave., New Haven, Conn. 1932
BARBOUR, ROGER, P.O. Box 382, Morehead, Ky. 1937
BARLOW, HENRY HOYT, 1704 Hinman Ave., Evanston, Ill. 1921
BARNARD, THEODORE WINTHROP, 46 Norfolk Road, Arlington, Mass. 1921
BARNES, CLAUDE TEANCUM, 359 Tenth Ave., Salt Lake City, Utah 1908
BARNES, ELLIS D., Carlsbad Caverns, Carlsbad, N. M. 1937
**BARNES, RICHARD MAGOON, Lacon, Ill. 1889
BARNÉS, DR. VENTURA, JR., Escuela Superior de Agricultura y Zootecnia, Caracas, Venezuela, S. A. 1936
BARRETT, CHARLES HORATIO MATCHETT, 1339 Valley Place, S. E., Washington, D. C. 1912
BARTEL, KARL EMIL EDGAR, 2528 W. Collins St., Blue Island, Ill. 1934
BARTLETT, GUY, Rosedale Rd., R. D. 1, Schenectady, N. Y. 1932
BARTON, ROGER AVERY, 54 Hays Hill Road, Pleasantville, N. Y. 1935
BARTRAM, EDWIN BUNTING, Bushkill, Pike Co., Pa. 1913
BASCOM, HUBERT PARKINSON, Stockton, St. Michael, Barbados, B. W. I. 1922
BASNER, HARRY, 22 W. 26th St., New York, N. Y. 1927
BASSETT, FRANK NEWTON, 8540 Holloway Drive, Los Angeles, Calif. 1919
BASSETT, MRS. VICTOR HUGO, 1010 E. Park Ave., Savannah, Ga. 1927
BATCHELDER, MRS. CHARLES FOSTER, Peterborough, N. H. 1930
BATES, CHARLES E., Box 34, East Wareham, Mass. 1936

BATTON, CHARLES HUSTON, 2125 Cottage Grove Ave., Des Moines, Iowa.....1934
BAUMGARTNER, FREDERICK MILTON, 629 E. Grand River, East Lansing, Mich. 1930
BAUMGARTNER, MRS. MARGUERITE HEYDWEILLER, 629 E. Grand River, East Lansing, Mich.....1932
BAY, JENS CHRISTIAN, The John Crerar Library, 86 E. Randolph St., Chicago, Ill.....1931
BEACH, DR. CHARLES COFFING, 54 Woodland St., Hartford, Conn.....1922
BEADEL, HENRY LUDLOW, Route 1, Tallahassee, Fla.....1926
BEAMER, LLOYD HENRY, Box 56, Meaford, Ont., Canada.....1935
BEARDSLEE, CLARK SMITH, 132 McKinley Ave., Kenmore, N. Y.....1930
BEATTY, HARRY A., Box 472, Christiansted, St. Croix, Virgin Ids.....1936
BECK, HERBERT HUEBENER, 515 N. President Ave., Lancaster, Pa.....1921
*BEDELL, MRS. LAUREL MAY, 1620 Mass. Ave., N. W., Washington, D. C.....1929
BEECHER, WILLIAM JOHN, 3048 N. Troy St., Chicago, Ill.....1937
BEED, WATSON E., Waubay Mig. Waterfowl Refuge, Waubay, S. Dak.....1936
BEHLE, DR. WILLIAM HARROUN, Dept. Biol., Univ. of Utah, Salt Lake City, Utah.....1934
BELCHER, PAUL EUGENE, 928 Stoner St., Akron, Ohio.....1937
*BELKNAP, JOHN BALCOM, Masonic Temple Bldg., Gouverneur, N. Y.....1927
BELL, MRS. CHARLES CONKLIN, Box 194, Saratoga, Calif.....1929
BELL, DR. WILLIAM BONAR, 803 Rittenhouse St., Washington, D. C.....1912
BELLROSE, FRANK CHAPMAN, 1220 W. Madison St., Ottawa, Ill.....1934
BENNETT, HENRY STANLEY, 111 Forest St., Oberlin, Ohio.....1929
BENNETT, LOGAN JOHNSON, Cooperative Wildlife Research Unit, State College, Pa.....1934
BENNETT, MISS MARY ALLISON, Dept. of Biology, W.I.S.T.C., Macomb, Ill...1937
BENNETT, THOMAS, 249 Cemetery Road, Lidget Green, Bradford, Yorkshire, England.....1930
BENNETT, WALTER WALDO, Arnold's Park, Iowa.....1924
BENNITT, RUDOLF, Dept. Zoöl., Univ. of Missouri, Columbia, Mo.....1932
BENSON, DIRCK, 310 Elmwood Ave., Ithaca, N. Y.....1935
BENSON, FRANK WESTON, 14 Chestnut St., Salem, Mass.....1920
BENSON, SETH BERTRAM, Mus. Vert. Zool., Univ. Calif., Berkeley, Calif.....1928
BERKHEIMER, DR. DAVID, 518 Elm St., Reading, Pa.....1932
BERLINER, ROBERT, 215 Club Drive, Woodmere, L. I., N. Y.....1937
BEROLZHEIMER, DANIEL DAVID, JR., 234 Woodmere Blvd. No., Woodmere, N. Y. 1934
BICK, DR. EDGAR M., 320 Central Park West, New York, N. Y.....1937
*BIGELOW, MRS. ARCHIBALD PIERCE, 270 Wayne Ave., Oakland, Calif.....1919
BIGELOW, HOMER LANE, The Farm, Windy Row, Peterborough, N. H.....1902
BIGELOW, DR. LYMAN FISHER, 80 Winter St., Norwood, Mass.....1914
BIRCKHEAD, HUGH, 433 Monterey Ave., Pelham Manor, N. Y.....1936
BIRD, MRS. F. G., 123 Pall Mall, London, S. W., 1, England.....1933
BIRD, DR. RALPH DURHAM, Box 250, Brandon, Man., Can.....1927
BIRKELAND, HENRY, R. R. No. 1, Nevada, Iowa.....1933
BISHOP, SHERMAN CHAUNCEY, Dept. Zoölogy, Univ. Rochester, Rochester, N. Y. 1919
BLACK, C[HARLES] THEODORE, 204 Exp. Zool. Lab., Champaign, Ill.....1933
BLACK, IRVING, 1 No. Locust Ave., Long Branch, N. J.....1935
**BLACKWELDER, ELIOT, Box N, Stanford University, Calif.....1895
BLAIN, DR. ALEXANDER WILLIS, 494 Lodge Drive, Detroit, Mich.....1929
BLAKE, MRS. CHARLES HENRY, Mass. Inst. Technology, Cambridge, Mass....1934

BLAKE, ROBERT EMMET REID, Field Museum, Chicago, Ill. 1933
BLAKE, DR. SIDNEY FAY, Bur. Plant Industry, Dept. Agr., Washington, D. C. (1910–16) 1923
BLICKENSDERFER, CLARK, 866 Grant St., Denver, Colo. 1929
BLINCOE, BENEDICT JOSEPH, R. D. 1, Box 363, Dayton, Ohio 1921
BLOOMFIELD, MRS. CHARLES C., 729 Michigan Ave., W., Jackson, Mich. 1901
BLOUGH, MRS. HELEN DOLMAN, Faculty Club North, Greeley, Colo. 1931
BOARDMAN, MISS ELIZA DENNIE, 416 Marlborough St., Boston, Mass. 1906
BODE, IRWIN THEODORE, 124 Forest Hill, Jefferson City, Mo. 1937
BODINE, MISS MARGARET LAMB, 1901 Walnut St., Philadelphia, Pa. 1927
BOESEL, MARION WATERMAN, R.D. 2, Oxford, Ohio 1922
BOETTNER, HENRY, 127 No. Murat St., New Orleans, La. 1936
BOGERT, CARDINE E., 30 East 71st St., New York, N. Y. 1937
BOGGS, IRA BROOKS, Oglebay Hall, Morgantown, W. Va. 1937
BOGGS, MISS MARION ALEXANDER, Rt. 1, Waynesville, N. C. 1924
BOHN, HERMAN L., 33–29 171st St., Flushing, N. Y. 1934
BOLT, BENJAMIN FRANKLIN, 5300 Brookside Blvd., Kansas City, Mo. 1909
BOOK, MISS LOIS ADELAIDE, 733 Franklin St., Columbus, Ind. 1928
BORELL, ADREY EDWIN, Box 1314, Albuquerque, N. M. 1927
BORROR, DONALD JOYCE, Dept. Zool., Ohio State Univ., Columbus, Ohio 1936
BOSSON, CAMPBELL, 30 State St., Boston, Mass. 1906
BOUSLOG, DR. JOHN SAMUEL, 6210 E. 17th Ave., Denver, Colo. 1930
BOWDISH, MRS. BEECHER SCOVILLE, Demarest, N. J. 1902
BOWEN, MISS ALICE MABEL, 437 Central St., Springfield, Mass. 1929
BOWEN, GEORGE BYRON, Lowville, N. Y. 1937
**BRACKEN, MRS. HENRY MARTYN, 999 College Ave., Claremont, Calif. 1897
BRADLEY, MISS ANNA PENFIELD, 352 Whitney Ave., New Haven, Conn. 1933
BRADLEY, JOSEPH MANTON, 111 Conant Rd., Weston, Mass. 1936
BRADT, HERBERT SCHUYLER, JR., 212 E. 48th St., New York, N. Y. 1930
*BRALY, JOHN CLAUDE, DePoe Bay, Oregon 1926
BRAMAN, MRS. MYRTLE, 206 W. Stayton Ave., Victoria, Texas 1937
*BRAND, MRS. ALBERT RICH, 9 East Ave., Ithaca, N. Y. 1934
*BRANDRETH, COURTENAY, Ossining, N. Y. 1905
BRANDT, HERBERT WILLIAM, 11945 Carlton Road, Cleveland, Ohio 1915
BRASSARD, DR. J. A., Quebec Zoöl. Gardens, Charlesbourg, Que., Can. 1935
BRAUN, HOWARD WYLIE, 1413 Louisiana Ave., N. W., Canton, Ohio 1936
BRAUND, FRANK WILLIAM, 1022 Central Ave., Cleveland, Ohio 1935
BRAUNER, JOSEPH, 426 Harral Ave., Bridgeport, Conn. 1936
BRENNAN, BERNARD P., 554 St. John's Place, Brooklyn, N. Y. 1933
BRERETON, DR. EWART LOUNT, Box 99, Barrie, Ont., Can. 1935
BRISTOL, MISS FRANCES LOUISA, Hotel Bossert, 98 Montague St., Brooklyn, N. Y. 1921
BROCKNER, WINSTON WILLIAM, 175 Dutton Ave., Buffalo, N. Y. 1936
BRODRICK, HAROLD JAMES, Carlsbad Caverns Nat. Park, Carlsbad, N. M. 1935
BROKAW, HOWARD PYLE, 614 Mt. Prospect Ave., Newark, N. J. 1933
BROLEY, CHARLES LAVELLE, 842 Corydon Ave., Winnipeg, Man., Can. 1926
BRONSON, BARNARD SAWYER, 46 Lenox Ave., Albany, N. Y. 1920
BROOKS, ALONZO BEECHER, Ogleby Park, Wheeling, W. Va. 1933
BROOKS, B. L., 19 Noel St., Ottawa, Can. 1936
BROOKS, DR. EARL, Noblesville, Ind. 1924

**BROOKS, REV. EARLE AMOS, 166 Plymouth Rd., Newton Highlands, Mass. . . 1892
BROOKS, MISS MARGARET, Shore Road, Old Greenwich, Conn. 1933
BROOKS, MAURICE GRAHAM, Dept. Biol., W. Va. Univ., Morgantown, W. Va. 1930
BROOMAN, RONALD CHARLES, c/o Bank of Montreal, Market Sq. Branch, London, Ont., Can. 1931
BROUN, MAURICE, c/o Miss Bessie Penniman, Orleans, Cape Cod, Mass. 1922
BROWN, MISS BERTHA LOUISE, 53 Court St., Bangor, Maine 1918
BROWN, CLARENCE D., 222 Valley Road, Montclair, N. J. 1937
BROWN, HARRY APPLETON, 40 Talbot St., Lowell, Mass. 1912
BROWN, JOHN WILLCOX, Dartmouth Outing Club, Hanover, N. H. 1932
BROWN, MISS LILLA MAUD, 76 Charles St., Auburndale, Mass. 1931
BROWN, RALPH MINTHORNE, Librarian V. P. I. Library, Blacksburg, Va. 1933
BROWN, WILLIAM JAMES, Apt. 14, 4129 Dorchester St., West, Westmount, Que., Can. 1908
BROWN, WILMOT WOOD, Hotel Mexico, Chilpancingo, Guerrero, Mexico 1929
BRUEN, FRANK, 22 High St., Bristol, Conn. 1908
BRUESTLE, BERTRAM GEORGE, 394 Whitney Ave., New Haven, Conn. 1929
BRUMBAUGH, CHALMERS SHERFEY, 2606 Elsinor Ave., Baltimore, Md. 1916
BRUNER, STEPHEN COLE, Estacion Agronomica, Santiago de las Vegas, Habana, Cuba 1926
*BRUUN, CHARLES ANAULTUS, 1510 Central Ave., Hot Springs, Ark. 1919
BRYANT, WILLIAM LETCHWORTH, Park Museum, Providence, R. I. 1926
BRYENS, OSCAR MCKINLEY, R. F. D. No. 1, McMillan, Luce Co., Mich. 1924
BUCHHEISTER, CARL W., Secy. Mass. Audubon Soc., 66 Newbury St., Boston, Mass. 1936
BUCKALEW, HERBERT, 611 East 2d St., Milford, Del. 1936
BUCKLE, JOHN WILLIAM, c/o Thomas Robertson & Co., P. O. Box 2460, Montreal, Can. 1928
BUJAK, B. J., Mus. Zool. Univ. of Michigan, Ann Arbor, Mich. 1936
BULKELEY, MORGAN GARDNER, 3D, 96 Woodland St., Hartford, Conn. 1935
BULLOCK, DAVIS JAMES, 225 Hibiscus Ct., Brownsville, Texas 1937
BULLOCK, DILLMAN SAMUEL, Casilla 2D, Angol, Chile 1920
BUMP, GARDINER, Conservation Dept., State Office Bldg., Albany, N. Y. 1933
BUMSTEAD, ALEXANDER RICHARD, Delaware City, Del. 1937
BUNDICK, MISS HARRIET ELLEN, 1465 Columbia Road, N. W., Washington, D. C. 1924
BUNTING, HOWARD WILLIAM, 76 Marvine Ave., Auburn, N. Y. 1937
BURGESS, JOHN KINGSBURY, West St., Dedham, Mass. 1898
BURGESS, THORNTON WALDO, 61 Washington Road, Springfield, Mass. 1919
BURKE, W. L., 701 E. 3d St., Vinton, Iowa 1937
BURNHAM, STEWART HENRY, Dept. Botany, Cornell Univ., Ithaca, N. Y. 1919
BURROWES, RICHARD BERESFORD, Sycamore House, Lydd, Kent, Eng. 1931
BURT, DR. WILLIAM HENRY, Mus. Zoöl., Univ. Michigan, Ann Arbor, Mich. . . 1925
BURTON, EDWARD MILBY, 18 Atlantic St., Charleston, S. C. 1929
BUSH, LEE, Cambria, Ill. 1934
BUTLER, ARTHUR LENNOX, St. Leonard's Park, Horsham, Sussex, England 1928
CADWALADER, CHARLES MEIGS BIDDLE, Acad. Nat. Sci., Philadelphia, Pa. 1924
CAHALANE, VICTOR HARRISON, Wildlife Div., Nat. Park Service, Washington, D. C. 1934
CAHN, DR. ALVIN ROBERT, T. V. A. Forestry Bldg., Norris, Tenn. 1917

CAIRNS, JOHN MACKAY, 333 Wheeler Ave., Scranton, Pa. 1926
CALHOUN, MISS EMMA MAY, 262 Commonwealth Ave., Boston, Mass. 1921
CALHOUN, JOHN B., c/o U. S. Hayes, Cabell Ave., University, Va. 1933
CALLENDER, JAMES PHILLIPS, 32 Broadway, New York, N. Y. 1903
CALVERT, EARL WELLINGTON, Halliburton P. O., Ont., Can. 1936
CAMPBELL, LOUIS WALTER, 304 Fearing Blvd., Toledo, Ohio 1929
CAMPBELL, MISS MILDRED F., 29 No. Hawthorne Lane, Indianapolis, Ind. 1936
CAMRAS, SIDNEY, 1448 So. Kolin Ave., Chicago, Ill. 1937
CANTWELL, GEORGE GORDON, Mus. Hist., Art. & Sci., Exposition Park, Los Angeles, Calif. 1929
CARLETON, GEOFFREY, 438 W. 116th St., New York, N. Y. 1933
CARLISLE, GEORGE LISTER, JR., Norfolk, Conn. 1920
CARLSON, A. J., Lakeside, Ohio 1937
CARLSON, T. O., 60 John St., New York, N. Y. 1934
CARMICHAEL, WILLIAM HALL, Carstairs, Alberta, Can. 1931
**CARPENTER, REV. CHARLES KNAPP, 10920 S. Boyne Ave., Chicago, Ill. 1894
CARR, JAMES W., JR., c/o Banks Hardware Co., Columbus, Miss. 1937
CARR, WILLIAM HENRY, Dept. Education, Am. Mus. Nat. Hist., New York, N. Y. 1932
CARRIGER, HENRY WARD, 5185 Trask St., Oakland, Calif. 1913
CARSON, HAMPTON LAWRENCE, JR., R. D. 2, Newton Square, Pa. 1935
CARTER, GEORGE FRANK, 408 Church St., Clyde, Ohio 1937
CARTER, JOHN DARLINGTON, Lansdowne, Pa. 1907
CARTER, THOMAS DONALD, Am. Mus. Nat. Hist., New York, N. Y. 1921
CARTWRIGHT, WILLIAM JAMES, Williamstown, Mass. 1920
CASSEL, FRANK, Wheaton College, Wheaton, Ill. 1935
CAYOUETTE, RAYMOND, 137 Wolfe St., Levis, Que., Can. 1936
CHALIF, EDWARD LOUIS, Barnsdale Road, Short Hills, N. J. 1935
CHAMBERLAIN, EDWARD BURNHAM, Charleston Mus., Charleston, S. C. 1923
CHAMBERLAIN, EDWARD BURNHAM, JR., Box 565, R. D. 4, Charleston, S. C. 1937
CHAMBERLAIN, GLEN DAVID, 22 Academy St., Presque Isle, Maine 1929
*CHAPIN, MISS ANGIE CLARA, c/o First National Bank & Trust Co., Ann Arbor, Mich. 1896
CHAPMAN, CLARENCE EDWARD, Oakland, N. J. 1924
CHAPMAN, FLOYD BARTON, 1944 Denune Ave., Columbus, Ohio 1936
CHAPMAN, MRS. FRANK MICHLER, 1158 Fifth Ave., New York, N. Y. 1908
CHAPMAN, LAWRENCE BOYLSTON, 8 Ingraham Rd., Wellesley, Mass. 1930
CHEESMAN, WILLIAM HANNOLD, Biological Survey, Washington, D. C. 1920
CHENAULT, TANEY PREWITT, Dept. Biology, A. & M. College, College Station, Tex 1937
CHENEY, REV. ROBERT FRANCIS, St. Mark's Rectory, Southborough, Mass. 1922
CHILDS, EDWARD CHILDERFOLK, P. O. Box 774, Reading, Pa. 1930
CHIN, WESLEY, 108 Mechanic St., Worcester, Mass. 1934
*CHURCH, MISS CYNTHIA, The Point, Great Neck, L. I., N. Y. 1926
CLARK, AUSTIN HOBART, 1818 Wyoming Ave., Washington, D. C. 1919
CLARK, MISS EDITH [DELIA] MAY, 350 Maine St., Glastonbury, Conn. 1929
CLARK, GEORGE ROBERTS, R. D. 4, Norristown, Pa. 1926
CLARK, HAROLD WILLARD, Angwin, Napa Co., Calif. 1931
CLARKE, CÉCILE, 2524 F St., Eureka, Calif. 1937
CLARKE, CHARLES EVERETT, 51 Summit Road, Medford, Mass. 1907

CLARKE, CHARLES HENRY DOUGLAS, Nat. Mus. Can., Dept. of Mines & Resources, Ottawa, Ont., Can. 1931
CLATTENBURG, ALBERT EDWIN, JR., Amer. Consulate General, Batavia, Java, Dutch East Indies 1929
CLAUSEN, ROBERT THEODORE, Bailey Hortatorium, Sage Place, Ithaca, N. Y. .. 1928
*CLEAVES, HOWARD HENDERSON, 8 Maretzek Court, Prince Bay, Staten Id., N. Y. 1907
CLEBSCH, ALFRED, 838 Gracey Ave., Clarksville, Tenn 1934
CLEGHORN, JAMES DONALD, 474 Mt. Pleasant Ave., Westmount, Montreal, Can. 1937
CLEMENT, ROLAND CHARLES, 436 County St., Fall River, Mass. 1935
CLEVELAND, LLEWELLYN WILLIAM, West Chop Rd., Vineyard Haven, Mass. .. 1932
CLOW, MISS MARION, P. O. Box 163, Lake Forest, Ill. 1929
COBB, DR. CLEMENT BIDDLE PENROSE, 1261 Madison Ave., New York, N. Y. .. 1933
COBB, DR. STANLEY, 334 Adams St., Milton, Mass. 1909
COBLE, AULDEN DELBERT, 6047 N. Neva Ave., Norwood Park, Chicago, Ill. .. 1934
COES, H. VINTON, JR., 18 Braemore Road, Upper Montclair, N. J. 1933
COFFEY, BEN BARRY, JR., 1434 Bank of Commerce Bldg., Memphis, Tenn. 1929
COFFIN, MRS. FRANCIS HOPKINSON, 1528 Jefferson Ave., Scranton, Pa. 1921
COFFIN, MRS. PERCIVAL BROOKS, 624 So. West A St., Richmond, Ind. 1905
COGGINS, HERBERT LEONARD, 1157 Filbert St., San Francisco, Calif. 1913
COHN, MARC, 29 Hope St., Bendigo, Victoria, Australia 1929
COKER, COIT MCLEAN, Box 950, Chapel Hill, N. C. 1930
**COLBURN, ALBERT ERNEST, 510 S. Normandie Ave., Los Angeles, Calif. 1891
COLEMAN, ROBERT HEMPHILL, R.D. 4, Box 212, Charleston, S. C. 1926
COLES, VICTOR, Hampton Institute, Hampton, Va. 1934
*COLLINS, HENRY HILL, JR., Forest Glen, Md. 1923
COLVIN, WALTER, Box 109, Arkansas City, Kansas 1932
COMEAU, EMILE, Quebec Zoöl. Gardens, Charlesbourg, Que., Can. 1935
COMPTON, MISS DOROTHY MAY, 22 Wilton St., Princeton, N. J. 1931
COMPTON, LAWRENCE VERLYN, 405 North 14th St., Albuquerque, N. M. 1926
CONGREVE, MAJOR WILLIAM MAITLAND, The White House, Llandyrnog, Denbigh, N. Wales, Gt. Britain 1928
CONISHEE, LEWIS RALPH, 34 Downs Road, Hastings, England 1937
CONKEY, JOHN HOUGHTON, 11 Chestnut St., Ware, Mass. 1929
CONRAD, CHARLES LOUIS, 423 Warwood Ave., Wheeling, W. Va. 1937
COOK, GRANT MACDONALD, 2301 Elm St., Youngstown, Ohio 1924
COOK, KENNETH, 308 No. 3rd St., Douglas, Wyoming 1937
COOK, WILLIAM BOLTON, 65 Wesley Ave., Port Chester, N. Y. 1929
COOLIDGE, OLIVER HILL, Broad Brook Road, Bedford Hills, N. Y. 1928
COOLIDGE, PHILIP TRIPP, 31 Central St., Bangor, Maine 1919
*COOMBES, ROBERT ARMITAGE HAMILTON, Sea Bank, Bolton-le-Sands, Carnforth, Lancashire, England 1935
**COPE, FRANCIS REEVE, JR., Dimock, Pa. 1892
COPELAND, PROF. MANTON, 88 Federal St., Brunswick, Maine 1900
COURSEN, CHARLES BLAIR, 761 E. 69th Place, Chicago, Ill. 1928
COURT, EDWARD JOSEPH, 1723 Newton St., N. W., Washington, D. C. 1927
COX, ARTHUR MALCOLM, 1135 Spruce St., Winnetka, Ill. 1927
COX, MISS ELIZABETH CORNELIUS, Route 1, New Hope, Pa. 1937
CRAIG, WALLACE, 280 Hamilton St., Albany, N. Y. 1912
CRAM, DR. ELOISE BLAINE, Div. Zoöl., Public Health Service, Washington, D. C. 1929

CRANE, MISS CLARA LOOMIS, Dalton, Mass. 1904
*CRANE, CORNELIUS, Ipswich, Mass. 1930
CRAWFORD, EUGENE E., 445 North 8th St., Corvallis, Oregon 1936
CRÉTE, REV. FRÈRE FLORIAN VIATEUR, 7400 rue St. Laurent, Montreal, Can. . 1933
CROMPTON, DAVIS HASTINGS, 74 William St., Worcester, Mass. 1934
CROOK, COMPTON, Matthew Whaley School, Williamsburg, Va. 1933
CROSS, ALBERT ASHLEY, Huntington, Mass. 1918
CROUCH, JAMES ENSIGN, State Teachers College, San Diego, Calif. 1928
CROWELL, MISS JOANN OLIVIA, Dennis, Mass. 1918
CROWELL, MRS. PRINCE SEARS, 4 Maple St., Franklin, Mass. 1930
CROWELL, MISS SARAH BELLE, Dennis, Mass. 1924
CRUICKSHANK, ALLAN D., c/o Audubon Association, 1775 Broadway, New York, N. Y. 1933
CRUMB, J. GLENN, Linesville, Crawford Co., Pa. 1936
CUNNINGHAM, JAMES W., 4425 Main St., Kansas City, Mo. 1937
CUNNINGHAM, JOSIAS, JR., Fernhill, Belfast, Northern Ireland 1928
**CURRIER, EDMONDE SAMUEL, 8541 N. Chicago Ave., Portland, Ore. 1894
CURRY, DR. HASKELL BROOKS, 228 E. Prospect Ave., State College, Pa. 1930
CURTIS, CHARLES PELHAM, 71 Ames Bldg., Boston, Mass. 1915
CURTIS, MISS ELIZABETH LONG, 5648 Beach Drive, Seattle, Wash. 1934
CURTIS, RICHARD CARY, 30 State St., Boston, Mass. 1935
CUTHBERT, NICHOLAS LE HUNAY, Dept. of Genetics, Univ. Wis., Madison, Wis. 1937
CUTLER, MRS. FREDERICK MORSE, 103 Butterfield Terrace, Amherst, Mass. 1923
CUTTER, VICTOR MACOMBER, JR., New London, N. H. 1936
DAMON, DAVID, S. P.—20, Kaiser, Mo. 1934
DANIELSON, KARL AUGUSTUS, Litchfield, Minn. 1928
DARBY, RICHARD T., 5236 Cedar Ave., Philadelphia, Pa. 1936
DARLINGTON, PHILIP JACKSON, JR., Mus. Comp. Zoöl., Cambridge, Mass. 1923
DARROW, ROBERT WESLEY, 7 Rural Place, Elesmere, N. Y. 1928
DAVIDSON, WILLIAM MARK, Insecticide Testing Lab., Beltsville, Md. 1927
DAVIS, MISS BERTHA EUNICE, 44 Center St., Brookline, Mass. 1920
DAVIS, C. N., Soil Conservation Service, Fulton, Mo. 1937
DAVIS, DAVID EDWARD, 721 Elmwood Ave., Wilmette, Ill. 1935
DAVIS, EARLE ANDREW, JR., 607 Reed St., Aliquippa, Pa. 1936
DAVIS, MISS EDDIE LEE, 1317 North Main St., Anderson, S. C. 1928
DAVIS, ELI, R. R. 7, London, Ont., Can. 1930
DAVIS, GEORGE, State Teachers College, Murfreesboro, Tenn. 1937
DAVIS, MRS. JAMES EDWARD, 45 E. 66th St., New York, N. Y. 1937
DAVIS, JOHN M., 227 Clark St., Eureka, Calif. 1920
DAVIS, L[OUIE] IRBY, Director Valley Lab., Box 669, Harlingen, Texas 1935
DAVIS, MALCOLM, 904 11th St., S. E., Washington, D. C. 1930
DAVIS, WILLIAM MORRIS, 535 Interlachen Ave., Winter Park, Fla. 1934
**DAY, CHESTER SESSIONS, 45 Englewood Ave., Brookline, Mass. 1897
DAYTON, REV. FRANCIS S., 603 Dickinson Dr., New London, Wis. 1937
DEADERICK, DR. WILLIAM HEISKELL, 36 Circle Drive, Hot Springs, Ark. 1931
DEAN, A[BRAM] LAWRENCE, Blacksburg, Va. 1933
DEAN, ROBERT HENRY, 720 Quintard Ave., Anniston, Ala. 1913
DEANE, H[ENRY] TOWNER, 1010 Hubbard Lane, Winnetka, Ill. 1931
DEAR, LT. COL. LIONEL SEXTUS, P. O. Box 127, Port Arthur, Ont., Can. 1928
DEARBORN, SAMUEL STEPHEN, 4 Newport Rd., Cambridge, Mass. 1919

DEBES, VICTOR ALBERT, 1211 Folsom Ave., Prospect Park, Pa. 1929
DECARIE, JULES ALBERT, 4121 Marlowe Ave., Montreal, Quebec, Can. 1932
DEED, ROBERT FREDERIC, Nyack, N. Y. 1937
DEGARIS, DR. CHARLES FRANCIS, Dept. Anatomy, Univ. Oklahoma, School of Medicine, Oklahoma City, Okla. 1923
DEIGNAN, HERBERT GIRTON, 7604 Alaska Ave., Washington, D. C. 1923
DELAFIELD, MRS. JOHN ROSS, 17 E. 79th St., New York, N. Y. 1933
DELAREUELLE, ROBERT R., 1136 East 33d St., Oakland, Calif. 1936
DELURY, DR. RALPH EMERSON, Dominion Observatory, Ottawa, Can. 1920
DEMILLE, JOHN BLAKENEY, 719 Victoria Ave., St. Lambert, Que., Can. 1922
DENLEY, CHARLES FREDERICK, Rockville, Md. 1927
DENMEAD, TALBOTT, 2830 St. Paul St., Baltimore, Md. 1923
DENNY, MISS MARTHA, Dept. Zoöl., Connecticut College, New London, Conn. 1924
DENSMORE, MISS MABEL, 605 East Ave., Red Wing, Minn. 1910
DENTON, JAMES FRED, Div. of Biology, Univ. of Georgia, Athens, Ga. 1935
DERBY, DR. RICHARD, Oyster Bay, L. I., N. Y. 1898
DETTMANN, WARREN, Milwaukee Public Museum, Milwaukee, Wis. 1936
DEUSING, MURL, 142 N. 75th St., Milwaukee, Wis. 1935
DEVITT, OTTO EDMUND, 31 Willowbank Blvd., Toronto 12, Ont., Can. 1933
DICE, DR. LEE RAYMOND, Zoöl. Mus., Univ. Michigan, Ann Arbor, Mich. (1918–27) 1931
DICK, JOHN HENRY, Ocean Ave., Islip, L. I., N. Y. 1937
DICKENS, MISS ELIZABETH, Block Island, R. I. 1921
DICKENSON, J. C., 1107 Wirtland Ave., University, Va. 1937
DICKINSON, FRANCIS REYNOLDS, 1518 Astor St., Chicago, Ill. 1935
DICKINSON, MISS GRACE IRENE, 12 State St., Worcester, Mass. 1935
**DILLE, FREDERICK MONROE, 822 Grand Ave., Nogales, Ariz. 1892
DILLEY, WILLARD E., 927 Weschler Ave., Erie, Pa. 1936
DINGLE, EDWARD VON SIEBOLD, Huger, S. C. 1920
DINGMAN, RUSSELL GORDON, York Mills, Toronto, R. R. 2, Ont., Can. 1926
DISE, MRS. MARY DAMERON, 5 Liberty St., Charleston, S. C. 1928
DIXON, EDWIN, Box 57, Unionville, Ont., Can. 1930
DOAK, CHARLES BOONE, 233 Lockhart Hall, Princeton, N. J. 1930
DOAK, WILLIAM CONWAY, 134 W. Coulter St., Germantown, Philadelphia, Pa. 1927
DOBIE, DUNCAN A., III, North Gate, Alger Court, Bronxville, N. Y. 1937
DODGE, ERNEST S., Peabody Museum, Salem, Mass. 1936
DODGE, THOMAS HENRY, Navajo Agency, Ft. Defiance, Ariz. 1930
DODGE, VICTOR K., 137 Bell Court, West, Lexington, Ky. 1937
DOLEMAN, MISS SUSAN AGNES, 55 Forbes Ave., Northampton, Mass. 1933
DOLESE, DAVID, 9090 Dwight Ave., Detroit, Mich. 1933
DOOLITTLE, EDWARD ARTHUR, Box 44, Painesville, Ohio 1921
DOREMUS, HENRY MEADE, Towaco, N. J. 1936
DORSEY, GEORGE ANDREW, 215 E. Hawthorne Ave., College Park, Ga. 1926
DOUGLASS, DONALD WICKMORE, Dept. Biol., Texas Technological College, Lubbock, Texas 1929
DOWNING, STUART CHALMERS, 58 Lappin Ave., Toronto, Ont., Can. 1935
DREVER, HORACE, 12 W. Mt. Airy Ave., Philadelphia, Pa. 1928
DREW, MRS. HOWARD ALBERT, 47 Maple Grove, Barre, Vt. 1934
DRURY, WILLIAM HALLANE, JR., Paradise Rd., Newport, R. I. 1935
DUBOIS, ALEXANDER DAWES, Christmas Lake Road, Route 2, Excelsior, Minn. (1905) 1918

DuBois, H[enry] M[athusalem], Clackamas, Oregon....1936
Dudley, Jack Murchie, 7 Calais Avenue, Calais, Maine....1931
Dudley, Mrs. Sarah Harris, Lyman School Branch, Berlin, Mass....1924
Duff, William McGill, 144 Ridge Ave., Ben Avon, Pa....1936
DuMont, Philip Atkinson, Sand Lake Waterfowl Refuge, Columbia, S. Dak. 1927
Duncan, Donald Pendleton, 5841 Nickerson Ave., Norwood Pk., Chicago, Ill....1937
Dunham, Mrs. Frederic Gibbons, 450 Beverly Road, Ridgewood, N. J....1933
Dunkleberger, Harry Warren, P. O. Box 6, Flourtown, Montgomery Co., Pa....1923
Dunn, John Warner Grigg, 1033 Lincoln Ave., St. Paul, Minn....1923
Durfee, Mrs. Owen, 243 Highland Ave., Fall River, Mass....1923
Duvall, Allen Joseph, Biol. Survey, Dept. Agr., Washington, D. C....1935
Dyke, Arthur Curtis, 205 Summer St., Bridgewater, Mass....1902
Eanes, Robert Hill, 1813 24th St., Galveston, Tex....1923
Earle, Samuel Lowndes, 1223 Niazuma Ave., Birmingham, Ala....1928
Eastman, William Raymond, Jr., 420 Cedar St., Douglas, Wyo....1937
Eaton, Richard Jefferson, 53 State St., Boston, Mass....1930
Eayre, Oscar Tomson, Barnegat, N. J....1937
Eckler, Harlan Emanuel, 1757 Hertel Ave., Buffalo, N. Y....1935
Edminster, Frank C., 1520 Elmira St., Williamsport, Pa....1937
**Edson, John Milton, Marietta Road, Bellingham, Wash....1886
Edson, William Lloyd Garrison, 54 Fairview Ave., Rochester, N. Y....1916
Edwards, James Leland, 27 Stanford Place, Montclair, N. J....1928
Eggleston, Julius Wooster, Junior College, Riverside, Calif....1929
Eheim, Joseph Mathious, 236 Adams St., S., Hutchinson, Minn....1927
Eike, James, Woodbridge P. O., Prince William Co., Va....1931
Einarsen, Arthur Skogman, 10 Home Econ. Bldg., Ore. State College, Corvallis, Ore....1935
Eisenmann, Eugene, 11 Broadway, New York, N. Y....1936
Ekblaw, Dr. Walter Elmer, Clark University, Worcester, Mass....1911
*Eldredge, Everett Raymond, Jr., Chatham, Cape Cod, Mass....1928
Eliot, Samuel Atkins, Jr., 32 Paradise Road, Northampton, Mass....1936
Elliott, Charles Fremont, 1932 No. 13th St., Philadelphia, Pa....1936
Elliott, Mrs. Jane Shields, 1867 Kalorama Rd., N.W., Washington, D. C....1921
Ellis, Prof. Hazel Rosetta, Keuka College, Keuka Park, N. Y....1935
*Ellis, Ralph, 2420 Ridge Road, Berkeley, Calif....1924
Emerson, Guy, 40 West 11th St., New York, N. Y....1935
*Emerson, William Otto, Route 1, Box 39, Hayward, Calif....1916
Emery, Frank Hardie, c/o Sandoz Chemical Works Ltd., 179 King St. W., Toronto 2, Ont., Can....1928
Emilio, Shepard Gilbert, 7 Winter St., Salem, Mass....1922
Emlen, Arthur Cope, "Awbury," Germantown, Philadelphia, Pa....1921
Emlen, John Thompson, Jr., College of Agric., Davis, Calif....1925
*Emmet, Col. Robert Temple, 550 E. 87th St., New York, N. Y....1926
Engleby, Thomas Lester, 308 Westover Ave., Roanoke, Va....1934
English, Almon Owen, 1002 Patterson Ave., Norfolk, Va....1928
Erichsen, Walter Jefferson, Oxford, Fla....1919
Erickson, Arnold B., 2828 32d Ave., S., Minneapolis, Minn....1936
Erman, Miss Celia, 2431 Pingree St., Detroit, Mich....1935

ERNSBERGER, MILLARD CLAYTON, 390 Oak Ave., Ithaca, N. Y. 1934
ERNST, MISS LILLIE ROSE, 6058 Kingsbury Ave., St. Louis, Mo. 1933
ESTEN, SIDNEY RAYMOND, 4112 Graceland Ave., Indianapolis, Ind. 1925
EVANS, DR. EVAN MORTON, 550 Park Ave., New York, N. Y. 1916
EYNON, ALFRED ERNEST, 1718 Andress Terr., Union, N. J. 1934
EZRA, ALFRED, Foxwarren Park, Cobham, Surrey, England 1928
FAGAN, CHARLES LOUIS, Rt. 2, Box 58, Rahway, N. J. 1922
FAIRMAN, MISS MARIAN, 4744 Kenwood Ave., Chicago, Ill. 1920
FARGO, WILLIAM GILBERT, 506 Union St., Jackson, Mich. 1923
FARIS, GEORGE ATKINSON, 4056 Kerckhoff Ave., Fresno, Calif. 1937
FARLEY, FRANK LEGRANGE, Box 1, Camrose, Alberta, Can. 1920
FARLEY, JOHN MOYER, JR., Avondale Rd., Gedney Farm Gardens, White Plains, N. Y. 1922
FAY, SAMUEL PRESCOTT, 2 Otis Place, Boston, Mass. 1907
*FEARING, GEORGE RICHMOND, 168 Beacon St., Boston, Mass. 1924
FEENEY, W. S., 410 Walton Pl., Madison, Wis. 1936
FEIGHNER, MISS LENA VETA, 298-I So. Tremont St., Kansas City, Kans. 1934
FELKER, JOHN OBERLE, Rt. 1, Box 403, Clayton, Mo. 1933
FELGER, ALVA HOWARD, North High School, Denver, Colo. 1898
FELL, MISS EMMA TREGO, Holicong, Bucks Co., Pa. 1903
FERGUSON, DAVID SOWERS, 225 11th St., Philipsburg, Pa. 1937
FERGUSON, HENRY LEE, 250 Park Ave., New York, N. Y. 1920
*FERGUSON, HOMER LENOIR, Newport News Ship Bldg., Newport News, Va. 1926
FERNEYHOUGH, JOHN BOWIE, 4020 Northrop St., Forest Hill, Richmond, Va. 1930
FERRIER, MISS JUDITH MADELINE, Hemsby Hall, Hemsby, Norfolk, England 1928
FIELD, MISS CAROLINE LOUISE, 38 Hampton Court, 1461 Mountain St., Montreal, Can. 1928
FINFROCK, CHARLES MILLARD, 3186 Oak Road, Cleveland Heights, Ohio 1925
FINSTER, MISS ETHEL B[EULAH], Box 5015, Biltmore Sta., Asheville, N. C. 1930
**FISHER, MISS ELIZABETH WILSON, 2222 Spruce St., Philadelphia, Pa. 1896
FISHER, DR. GEORGE CLYDE, Am. Mus. Nat. Hist., New York, N. Y. 1908
FISHER, WALTER TAYLOR, 135 So. La Salle St., Chicago, Ill. ..... (1907–14) 1932
FLEMING, MRS. THOMAS, JR., 1541 Lombardy Road, Pasadena, Calif. 1935
FLETCHER, MRS. J. F. S., Dimock P. O., Pa. 1933
FLETCHER, MRS. MARY ELIZABETH, Proctorsville, Vt. 1898
FLOOD, MRS. AUBREY CLEVELAND, 700 Whitmore Rd., Detroit, Mich. 1933
FLOYD, CHARLES BENTON, 454 Wolcott St., Auburndale, Mass. 1916
FOOT, DR. NATHAN CHANDLER, 47 E. 88th St., New York, N. Y. 1916
FOOTE, MAURICE E., R.R. No. 1, New London, Ohio 1937
FORD, FRANCIS, 114 Allyn St., Holyoke, Mass. 1927
FORD, MISS LOUISE PETIGRU, "The Heights," Aiken, S. C. 1919
FORTNER, PROF. HARRY CADWALLADER, 102 Bidwell Ter., Rochester, N. Y. 1929
FOSSLER, MISS MARY LOUISE, 550 N. Las Robles Ave., Pasadena, Calif. 1937
FOSTER, MISS CAROLINE ROSE, Mendham Road, Morristown, N. J. 1928
*FOSTER, FRANCIS APTHORP, Edgartown, Mass. 1918
*FOSTER, FRANK BRISBIN, Broadwater Farm, Phoenixville, Pa. 1916
FOSTER, GEORGE W., JR., 15 West Circle Drive, Norris, Tenn. 1936
FOSTER, JACK BONNELL, 135½ So. Santa Fe St., Salina, Kansas 1937
*FOSTER, JOHN HAWLEY, P. O. Box H, Haverford, Pa. 1927
FOSTER, MAXWELL EVARTS, South Hamilton, Mass. 1932

FOULKES-ROBERTS, CAPT. PETER ROBERTS, Westwood, Goring-on-Thames, England....1935
**FOWLER, FREDERICK HALL, 221 Kingsley Ave., Palo Alto, Calif....1892
FOWLER, HENRY WEED, Acad. Nat. Sciences, Philadelphia, Pa....1898
FOX, ADRIAN CASPAR, Soil Conservation Service, Box 367, Park River, N. Dak.1935
FOX, MISS JENNIE ETHEL, Palisades, Rockland Co., N. Y....1925
FRANK, T. RUSSELL, 40 Susquehanna St., Abington, Pa....1937
FRANZEN, ALBERT JOHN, Field Museum Natural History, Chicago, Ill....1934
FRAZIER, JOSEPH FRANKLIN, 724 Proctor Place, Independence, Mo....1928
FREE, GEORGE JAMISON, 626 Sunset Road, State College, Pa....1935
FREEMAN, JOHN FRAMPTON, Box 264, Mt. Pleasant, S. C....1937
FRENCH, MRS. ALFRED JASON, R. F. D. 1, Box 40, Carlton, Ore....1921
FRENCH, MRS. MENA VESTAL, Box 171, Wayland, Mass....1923
*FREY, MRS. EDITH KRIEGER, 814 3d St., Jackson, Mich....1923
FRICKE, REINHOLD LEO, Carnegie Museum, Pittsburgh, Pa....1927
FRIEDMAN, RALPH, 14 East 75th St., New York, N. Y....1935
FRISHMAN, KENNETH IRISH, 1114 9th Ave., S., Fargo, N. Dak....1936
FROST, ALLEN, 143 Academy St., Poughkeepsie, N. Y....1919
FROST, MRS. CHARLES SUMNER, Deerpath Inn, Lake Forest, Ill....1936
FRY, MRS. GLADYS GORDON, 66 Eagle Rock Way, Montclair, N. J....1925
FRY, J. D., 1221 Osborne St., Montreal, Can....1935
FULLER, ARTHUR BENNETT, Broadmoor Rd., Midland Moor, Mentor, Ohio....1922
FULLER, HENRY CORBIN, 3704 Huntington St., Washington, D. C....1916
FULLER, HENRY SHEPARD, 3704 Huntington St., Washington, D. C....1935
FULLER, MRS. WILLARD PERRIN, Nickerson Rd., Dedham, Mass....1937
FURNISS, OWEN CECIL, 2203 1st Ave., W., Prince Albert, Sask., Can....1931
FURTH, JOHN THOMAS, 436 Felton Ave., Highland Park, N. J....1937
GALLAGHER, WILLIAM EMMET, 244-20 90th Ave., Bellerose, L. I., N. Y....1937
GARDINER, CHARLES BARNES, 175 W. Main St., Norwalk, Ohio....1903
GARDNER, MAJOR LEON LLOYD, 1815 Kilbourne Pl., N. W., Washington, D. C. 1924
GARRETT, MRS. HARRY LEE, 1523 31st St., Galveston, Texas....1929
GARRISON, DAVID LLOYD, 65 Sterling St., West Newton, Mass....1937
GATES, FRANK WARD RISDON, 33 Zion St., Hartford, Conn....1928
*GAUNTLETT, FREDERICK JOHN, 16 Primrose St., Chevy Chase, Md....1925
GEIST, OTTO WILLIAM, University of Alaska, Museum Dept., P. O. College, Alaska....1937
GEIST, DR. ROBERT MILLER, Dept. Biology, Capitol University, Columbus, O. 1923
GENERAS, HENRY JOHN, 233 Washington Ave., Clifton, N. J....1937
GETHING, PETER, 11 Water St., Charleston, S. C....1937
GIER, HERSCHEL T., Ohio University, Zoology Dept., Athens, Ohio....1937
GILDING, MRS. Z. L., Vicksburg, Mich....1937
GILES, NORMAN HENRY, JR., 15 Conant Hall, Harvard Univ., Cambridge, Mass....1930
GILLHAM, CHARLES E., R. D. 1, Box 80, Edwardsville, Ill....1937
GILLIN, JAMES RHOADS, Ambler, Pa....1921
GILLIS, FRANK, 508 Park St., Anoka, Minn....1922
GILMORE, MRS. ALBERT ESTES, 2215 E. Admiral Bldg., Tulsa, Okla....1927
GIRLING, WILLIAM G., 530 English St., London, Ont., Can....1937
GIVLER, MRS. ROBERT CHENAULT, 226 College Ave., Tufts College P. O., Mass..1937
GLADDING, MRS. JOHN RUSSELL, Thompson, Conn....1912

GLENDENNING, MISS BETTY GEORGIA, 673 Brookwood Road, Oakland, Calif...1937
GLENN, ROBERT W., 509 Orchard Ave., Avalon, Pittsburgh, Pa.....1937
GLOVER, PERCY HAMPTON, Broadlands, Fareham, Hampshire, Eng.....1931
GOELITZ, WALTER ADOLPH, 240 Little Neck Road, Douglaston, L. I., N. Y.....1916
GOELLNER, REV. EUGENE, St. Anselm's College, Manchester, N. H.....1928
GOETZ, CHRISTIAN JOHN, 3503 Middleton Ave., Cincinnati, Ohio.....1929
GOLDSMITH, GLENN WARREN, Box 1611, University Station, Austin, Texas....1926
GOODALL, LIEUT. HENRY WILLIAM, U. S. Naval Academy, Annapolis, Md.....1937
GOODRICH, MISS JULIET THEODOSIA, Land o' Lakes, Vilas County, Wis.....1904
GORDON, HARRY EDGAR, 307 Laburnum Crescent, Rochester, N. Y.....1911
GORDON, HUNTLY KAY, 34 Glen Elm Ave., Toronto 12, Ont., Can.....1933
GORDON, KENNETH LLEWELLYN, Dept. Zoöl., State Agric. Coll., Corvallis, Oregon.....1924
GORDON, SETH EDWIN, 2001 Market St., Harrisburg, Pa.....1924
GOSLIN, CHARLES R., 407 Washington Ave., Lancaster, Ohio.....1936
GOULD, MRS. J. AVERY, 38 Phillips St., Andover, Mass.....1930
**GOULD, JOSEPH EDWARD, 1920 Springfield Ave., Campostella Heights, Norfolk, Va.....1889
GRANGE, WALLACE BYRON, Babcock, Wood Co., Wis.....1920
**GRANGER, WALTER WILLIS, Amer. Mus. Nat. Hist., New York, N. Y.....1891
GRANT, CLEVELAND PUTNAM, 620 Greenup St., Covington, Ky.....1924
GRANT, WILLIAM WRIGHT, 100 W. Univ. Parkway, Baltimore, Md.....1910
GRASS, ARTHUR MERRITT, 339 B St., N.E., Linton, Ind.....1935
GRATER, RUSSELL KAY, 255 U. S. Customs Building, Denver, Colo.....1937
GRAY, ALWYN EVERETT, 1016½ N.W. 20th St., Oklahoma City, Okla.....1923
GRAY, GEORGE WASHINGTON, Greenvale Farm, Poughkeepsie, N. Y.....1920
GREELEY, FREDERICK, 200 Chestnut St., Winnetka, Ill.....1936
GREELEY, JOHN RICHARD, 1320 North Univ. Ave., Ann Arbor, Mich.....1925
*GREEN, MORRIS MILLER, 39 Wyoming Ave., Ardmore, Pa.....1921
GREENE, EARL ROSENBURY, Fargo, Georgia.....1921
GREENOUGH, HENRY VOSE, 39 Worthington Road, Brookline, Mass.....1901
GREENWALT, ERNEST JAGGER, Wichita Mts. Wildlife Refuge, Cache, Okla.....1932
GREGORY, REV. CAREY ELLIS, Box 763, Morganton, N. C.....1922
GREGORY, TAPPAN, 19 So. La Salle St., Chicago, Ill.....1931
GRIFFIN, DONALD R., M 31 Lowell House, Harvard Univ., Cambridge, Mass. 1936
GRIGGS, JULIAN G., c/o National Park Service, Yorktown, Va.....1937
GRIMES, SAMUEL ANDREW, Rt. 5, Box 284F, Jacksonville, Fla.....1925
GRINNELL, ELMER NATHAN, 2538 Wilson Blvd., Arlington, Va.....1932
GRINNELL, MRS. JOSEPH, 2737 Forest Ave., Berkeley, Calif.....1931
GRISWOLD, JOHN AUGUSTUS, JR., Mus. Comp. Zool., Cambridge, Mass.....1933
GROFF, MISS FRANCES LLOYD, 19 West Union St., West Chester, Pa.....1929
GROGAN, MISS MARY A., 3317 Westerwald Ave., Baltimore, Md.....1936
GROMME, OWEN JUSTUS, Public Museum, Milwaukee, Wis.....1924
GROSKIN, HORACE, 220 St. Georges Road, Ardmore, Pa.....1935
GROSS, MARGARET E., R.D. 5, Grand Rapids, Mich.....1936
*GUERNSEY, RAYMOND GANO, Eden Terrace, Poughkeepsie, N. Y.....1928
*GUILD, EASTHAM, Box 56, Papeete, Tahiti.....1930
GUION, GEORGE SETH, 1701 American Bank Bldg., New Orleans, La.....1934
GUNN, WILLIAM WALKER HAMILTON, 7 Coldstream Ave., Toronto, Ont., Can..1935
GUNTHORP, DR. HORACE, University Sta., Tucson, Ariz.....1919

GUTHRIE, DR. DONALD, Robert Packer Hospital, Sayre, Pa.....1930
HADLEY, ALDEN HERVEY, 136 Arlington Way, Ormond Beach, Fla.....1906
HADLOW, RUTH, 4263 W. 143rd St., Cleveland, Ohio.....1937
HAGAR, MRS. JOHN DAVID, Rockport, Texas.....1937
HAGAR, JOSEPH A., Marshfield Hills, Mass.....1935
HAGNER, DR. FRANCIS RANDALL, 1824 19th St., N. W., Washington, D. C.....1926
HAGUE, MISS FLORENCE, Sweet Briar College, Sweet Briar, Va.....1930
HAINES, ROBERT LEE, 126 Maple Terrace, Merchantville, N. J.....1924
HALDEMAN, MISS DORIS WEISS, E. Mt. Airy Ave., Philadelphia, Pa.....1927
HALE, ARTHUR THOMAS, JR., P. O. Box 753, Mission, Texas.....1934
HALL, NORMAN WINSLOW, 34 Robin Hood Road, Arlington, Mass.....1937
HALLE, LOUIS JOSEPH, JR., R. D. 1, New Canaan, Conn.....1934
HALLER, KARL WILLIAM, Route No. 1, Short Creek, W. Va.....1937
HALLMAN, ROY CLINE, P. O. Box 826, Panama City, Fla.....1928
HAMILTON, ARTHUR LINCOLN, 836 North Raymond Ave., Pasadena, Calif.....1929
HAMILTON, DR. WILLIAM JOHN, JR., Dept. Zoöl., McGraw Hall, Cornell Univ., Ithaca, N. Y.....1924
HAMMOND, EDWARD KING, 228 N. La Salle St., Chicago, Ill.....1937
HAMMOND, MERRIL CLYDE, Lower Souris Refuge, Upham, N. Dak.....1937
HAMMOND, DR. ROLAND, 41 Boyleston Ave., Providence, R. I.....1924
HAMMETT, WILLIAM LAWRENCE, Rock Haven Lodge, Edneyville, N. C.....1937
HAMPE, IRVING EDWARD, 3909 Wilkins Ave., Baltimore, Md.....1933
HAND, RALPH LEVI, 543 So. 5th St., W., Missoula, Mont.....1929
HANDLAN, JOHN WELTY, Oglebay Institute, Oglebay Park, Wheeling, W. Va.....1933
HANDLEY, CHARLES OVERTON, Blacksburg, Va.....1916
HANN, DR. HARRY WILBUR, Zoöl. Dept., Univ. Mich., Ann Arbor, Mich.....1930
HANNA, DR. G. DALLAS, Calif. Acad. Sci., San Francisco, Calif.....1930
HANNA, WILSON CREAL, 141 East F St., Colton, Calif.....1919
HANSON, HAROLD, 3658 No. Harding Ave., Chicago, Ill.....1937
HARDING, MRS. RICHARD BRUCE, 121 University Road, Brookline, Mass.....1922
HARING, MRS. INEZ MARIA, Woodland, Ulster Co., N. Y.....1921
HARKIN, HON. JAMES BERNARD, Canadian Nat. Parks, Ottawa, Can.....1921
HARLLEE, CAPT. HARRY LEE, 900 S. Irby St., Florence, S. C.....1932
HARMON, J[OHN] WILL, 1532 N. W. 29th St., Oklahoma City, Okla.....1937
HARRINGTON, DR. PAUL, 813 Bathurst St., Toronto, Ont., Can.....1922
HARRIOT, SAMUEL CARMAN, 200 West 58th St., New York, N. Y.....1934
HARRIS, ALAN C., Griswolden, 60 Dreilinden Str., Lucerne, Switzerland.....1934
HARRIS, ARTHUR LESLIE, Ultimo House, Kangaloon Rd., Bowrall, N. S. W.....1929
HARRIS, DR. ARTHUR TREVENNING, 504 Broadway, Gary, Ind.....1935
HARRIS, MRS. HUGH H., Emory University, Ga.....1934
HARRIS, LUCIEN, JR., c/o The Macmillan Co., 500 Spring St., N. W., Atlanta, Ga.1930
HARRIS, ROBERT DOUGLAS, Vermont Cottage, La Haule, St. Brelade, Jersey, Channel Ids.....1929
HARRIS, WILLIAM GEORGE FOWLE, 13 Richmond St., Dorchester, Mass.....1933
HARRIS, MRS. WILLIAM GRAY, 10 Harvard St., Worcester, Mass.....1933
*HARRIS, WILLIAM PICKETT, 15410 Windmill Point Drive, Grosse Pointe Parks, Mich.....1925
HARRISON, ED NEWTON, Box 324, Encinitas, San Diego Co., Calif.....1934
*HARRISON, GEORGE LEIB, JR., 1520 Locust St., Philadelphia, Pa.....1919
HARROWER, DR. DAVID ELSON, 1032 W. Broadway, Woodmere, L. I., N. Y.....1933

HART, WILLIAM STEPHEN, Box 1185, Montreal, Que., Can. 1926
HARTZ, MISS BETTY, The Plymouth, 1236 11th St., N.W., Washington, D. C. 1936
HARVEY, JOHN LEGRAND, Mercantile Bldg., Waltham, Mass. 1916
HASBROUCK, HENRY CRANE, 88 Douglas Rd., Glen Ridge, N. J. 1920
*HASKELL, MISS SADIA, 3828 30th St., Mt. Rainier, Md. 1916
HATHAWAY, MRS. EMILY LOUISE, Spring St., Rt. 1, W. Bridgewater, Mass. ... 1920
**HATHAWAY, HARRY SEDGWICK, corner of Riverside and Thorn Aves., South Auburn, Cranston, R. I. 1897
HAUSMAN, DR. L[EON] A[UGUSTUS], Dept. Zool., N. J. College for Women, New Brunswick, N. J. 1936
HAUTHAWAY, CLARENCE LITTLE, 638 Summer St., Lynn, Mass. 1927
**HAVEMEYER, HENRY OSBORNE, Mahwah, N. J. 1893
HAVEN, HERBERT MAURICE WEST, 500 Forrest Ave., Portland, Maine 1920
HAVERSCHMIDT, FRANCOIS, 119 Kleverparkweg, Haarlem, Holland 1928
HAYDU, EUGENE P., 3169 E. 130 St., Cleveland, Ohio 1937
HAYES, MRS. EDWIN AUGUSTUS, 466 Elm St., New Haven, Conn. 1927
HAYES, LAWRENCE EMERY, Box 3026, University Station, Columbus, Ohio 1937
HEBARD, FREDERICK VANUXEM, 8001 Navahoe St., Chestnut Hill, Philadelphia, Pa. 1930
HECK, DR. EDSON BURR, 117 West 11th St., New York, N. Y. 1936
HEGNER, FRANCIS ARNOLD, 513 Hill St., Sewickley, Pa. 1924
HEILNER, VAN CAMPEN, Spring Lake Beach, N. J. 1925
HELFER, MISS LOUISE, 111 Ninth St., Watkins Glen, N. Y. 1929
*HELME, ARTHUR HUDSON, 223 Bayview Terrace, Port Jefferson, N. Y. 1888
HELMUTH, DR. WILLIAM TOD, 3D, 667 Madison Ave., New York, N. Y. 1923
HEMPHILL, FREDERICK ARNOLD, 128 Broad St., Elizabeth, N. J. 1929
HENDERSON, WALTER CLEAVELAND, 8 Magnolia Parkway, Chevy Chase, Md. 1917
HENDRICKS, GEORGE BARTLETT, 115 Wendell Ave., Pittsfield, Mass. 1935
HENIKA, FRANKLIN S., 207 Whitman St., Pullman, Wash. 1937
HENRY, CORDIA JOHN, Box 37, Upham, N. D. 1934
HENSHAW, SAMUEL, 28 Fayerweather St., Cambridge, Mass. 1924
HERBST, MRS. THEODORE WILHELM, Faircourt, Bernardsville, N. J. 1931
HERING, PAUL E., Oglethorpe University, Ga. 1934
HERMAN, CARLTON MARTIN, Johns Hopkins Univ., School of Hygiene, 615 N. Wolfe St., Baltimore, Md. 1936
HERMAN, DR. WILLIAM CEPHAS, 19 West 7th St., Cincinnati, Ohio 1921
HERRICK, MISS ELEANOR ELIZABETH, 935 Smith Lane, Woodmere, L. I., N. Y. 1933
HERSHEY, MISS CLARA LOUISE, 168 Lincoln St., Shelton, Pa. 1937
HEYDWEILLER, MISS MARY K., Fernow Hall, Cornell Univ., Ithaca, N. Y. 1936
HIATT, BENJAMIN CHAPMAN, 27 Clay Ave., East Roselle Park, N. J. (1925–29) 1936
HIBBARD, CLAUDE WILLIAM, Mus. Vert. Paleont., Univ. Kansas, Lawrence, Kan. 1934
HIBBERT, MRS. HAROLD, 17 Parkside Place, Côte de Neiges Road, Montreal, Que., Can. 1926
HICKEY, JOSEPH JAMES, 2952 Marion Ave., New York, N. Y. 1936
*HIGHAM, WALTER ERNEST, The Oaks, Clayton-le-Dale, near Blackburn, England 1928
HILL, FREDERICK WILLIAM, 690 Bluff St., Glencoe, Ill. 1933
HILL, JULIAN WERNER, 707 Coverdale Road, Wilmington, Delaware 1934
HILL, MRS. THOMAS ROBY, 4011 Baltimore Ave., Philadelphia, Pa. 1903
HINCHMAN, RICHARD MAY, 75 Fairbanks Rd., Milton, Mass. 1930

HINDS, FRANK J., Dept. Biology, Western State Teachers College, Kalamazoo, Mich. 1935
HINSHAW, THOMAS DOANE, 1908 Scottwood Ave., Ann Arbor, Mich. 1930
HIX, GEORGE EDWARD, 337 72d St., Brooklyn, N. Y. 1904
HOBSON, MRS. L. G., 1155 Dove Road, Louisville, Ky. 1936
HOECHSTETTER, MRS. S. S., 427 E. St. Johns St., Lake City, Fla. 1933
HOFFMAN, EDWARD CARLTON, 1041 Forest Cliff Dr., Lakewood, Ohio 1928
HOFFMAN, IRVIN NEWTON, R. F. D. 6, Bethesda, Md. 1924
HOLBROOK, MISS ADDIE E., Juneau, Alaska 1937
HOLLAND, HAROLD MAY, Box 615, Galesburg, Ill. 1910
HOLMAN, JOHN PAULISON, Fairfield, Conn. 1922
HOLT, DR. WILLIAM LELAND, Scarborough, Maine 1937
HONYWILL, ALBERT WILLIAM, JR., P. O. Box 288, Detroit, Mich. 1907
HOPE, CLIFFORD ERNEST, Roy. Ontario Mus. Zoöl., 100 Queen's Park, Toronto, Ont., Can. 1933
HORSEY, RICHARD EDGAR, 440 Highland Ave., Rochester, N. Y. 1919
HORSFALL, ROBERT BRUCE, 3835 S St., N.W., Washington, D. C. 1905
HOSTETTER, DAVID RALPH, Eastern Mennonite School, Harrisonburg, Va. 1937
HOTCHKISS, NEIL, Biol. Survey, Dept. Agr., Washington, D. C. 1935
HOUGHTON, CLARENCE, Hillview, Rensselaer, N. Y. 1920
HOWARD, WILLIAM JOHNSTON, 801 Grace Securities Bldg., Richmond, Va. 1937
HOWE, DR. CLIFTON DURANT, Faculty of Forestry, Univ. Toronto, Toronto, Ont., Can. 1921
HOWELL, JOSEPH CORWIN, Fernow Hall, Ithaca, N. Y. 1928
HOWELL, ROYSTON WYNTER, Queens Chambers, 6 Victoria Parade, Torquay, Devon, England 1934
HOWELLS, MRS. GERTRUDE W., Mesilla Park, N. M. 1935
HOYT, JOHN SOUTHGATE YESTON, 5 Lewis St., Lexington, Va. 1935
HUBBARD, HUGH WELLS, American Board Missions, Paotingfu, China 1928
HUBER, MRS. WHARTON, 225 St. Mark's Square, Philadelphia, Pa. 1926
HUDSON, GEORGE ELFORD, 4635 Knox St., Lincoln, Nebr. 1928
HUFF, PROF. NED L., 1219 7th St., S. E., Minneapolis, Minn. 1924
HUGGINS, RUSSELL A., Biol. Dept., Western Reserve Univ., Cleveland, Ohio 1936
HUGHES, GEORGE THOMAS, Box 153, Plainfield, N. J. 1919
HUGHES, DR. WILLIAM ELLERY, 3945 Chestnut St., Philadelphia, Pa. 1920
HULBURT, MILTON FRANK, Lock Box 502, Reedsburg, Wis. 1934
HUMPHREY, MRS. H. B., Cabin John, Md. 1933
HUMPHREYS, WILLIAM WIRT, 15 Limehouse St., Charleston, S. C. 1932
**HUNN, JOHN TOWNSEND SHARPLESS, 1218 Prospect Ave., Plainfield, N. J. 1895
HUNNEWELL, MISS LOUISA, Washington St., Wellesley, Mass. 1936
HUNNEWELL, WILLARD P., Box 373, St. Paul's School, Concord, N. H. 1937
HUNT, MISS HELEN CUMMINGS, Washington, Conn. 1928
HUNT, MISS LUCY OLCOTT, 185 Beacon St., Hartford, Conn. 1919
HURD, MISS FRANCES AMELIA, 119 West Ave., South Norwalk, Conn. 1919
HURLBUT, WILLIAM ELLIS, Vineland, Ont., Can. 1935
HUTT, DR. FREDERICK BRUCE, Dept. Poultry Husbandry, Cornell University, Ithaca, N. Y. 1932
HUTTER, ELMER P., 304 Argyle Road, Brooklyn, N. Y. 1936
*HUYLER, COULTER DUNHAM, address unknown 1928
HYDE, ARTHUR SIDNEY, c/o Dr. L. B. Pilsbury, 3997 Washington Ave., San Francisco, Calif. 1921

HYDE, LATIMER BALLOU, 100 Church St., Ware, Mass. 1935
IJAMS, HENRY PEARLE, R. F. D. 9, Knoxville, Tenn. 1922
**INGERSOLL, ALBERT MILLS, 908 F St., San Diego, Calif. 1885
INGRAHAM, EDWARD ANDREWS, 444 Clinton Ave., Brooklyn, N. Y. 1930
INGRAM, GEOFFREY CHESELDEN SPENCER, 22 Waterloo Road, Roath, Cardiff, South Wales 1928
**ISHAM, CHARLES BRADLEY, 236 McCash Rd., Upper Montclair, N. J. 1891
IVES, FREDERICK MANLEY, JR., 27 Allen Rd., Winchester, Mass. 1930
JACKSON, CICERO FLOYD, Dean, Coll. Liberal Arts, Univ. N. H., Durham, N. H. 1936
JACKSON, DR. HARTLEY HARRAD THOMPSON, Biol. Survey, Washington, D. C. ..1910
JACKSON, MRS. RICHARD NEWTON, "Venture," Stevenson, Baltimore Co., Md. 1937
JACOBY, THOMAS EDWIN, 816 B St., N. E., Washington, D. C. 1931
JAMES, MRS. ALVIN ORLANDO, 4100 Grove Ave., Richmond, Va. 1925
JAMES, NORMAN, P. O. Drawer D2, Baltimore, Md. 1913
JANVRIN, DR. EDMUND RANDOLPH PEASLEE, 38 East 85th St., New York, N. Y. 1919
JANZEN, DANIEL H., 504 Title Guaranty Bldg., Milwaukee, Wis. 1936
JAY, WILLIAM, 5358 Winghocking Terrace, Germantown, Philadelphia, Pa. 1921
JELIER, FRANCISCUS PETER, Groote Visscherijstraat 19a, Rotterdam, Holland .. 1928
JENKINS, LLOYD SMITH, 10 Ashmore Road, Worcester, Mass. 1932
JENKS, RANDOLPH, Mt. Kemble, Morristown, N. J. 1928
JENNER, WILLIAM ALEXANDER, 806 W. Davis St., Fayette, Mo. 1932
JENSEN, JESSE PETER, Box 364, Dassel, Minn. 1926
JESSMAN, MISS LENA M., 11 Linden St., River Rouge, Mich. 1935
JEWETT, MISS DOROTHY, 441 Baldwin Rd., Maplewood, N. J. 1936
JOHN, THOMAS, 220 Jefferson Ave., Washington, Pa. 1937
JOHNSON, ARCHIBALD, R. D. 2, Jamestown, N. D. 1930
*JOHNSON, CHARLES ALFRED, 1030 15th St., Denver, Colo. 1927
JOHNSON, FRED., Downham Tavern, Bromley, Kent, England 1934
JOHNSON, JULIUS MONROE, 293 S. Pleasant Ave., Ridgewood, N. J. 1933
JOHNSON, MURRAY LEATHERS, 4102 N. 38th St., Tacoma, Wash. 1935
JOHNSON, PERRY FRANK, 1202 Kenwood Ave., Fort Wayne, Ind. 1937
JOHNSON, PROF. ROBERT ANTHONY, 150 East Street, Oneonta, N. Y. 1930
JOHNSTON, ISRAEL HAYLOCK, Conserv. Comm., Charleston, W. Va. ..... (1922) 1934
JONES, FRED MINSON, Wise, Va. 1931
JONES, GORDON WILLIS, "Ellwood," Wilderness, Va. 1933
JONES, HAROLD CHARLES, 352 W. College St., Oberlin, Ohio 1924
JONES, HAROLD ROBERT, 317 New York St., Scranton, Pa. 1935
JONES, JOHN COURTS, 3224 19th St., Washington, D. C. 1930
JONES, DR. LOMBARD CARTER, Falmouth, Mass. 1917
JONES, S[OLOMON] PAUL, 509 West Ave., North, Waukesha, Wis. 1920
**JORDAN, ALVAH HENRY BEDELL, Lowell, Wash. 1888
JUNG, CLARENCE SCHRAM, 4612 N. Oakland Ave., Milwaukee, Wis. 1921
KALTER, DR. LOUIS BIESER, 535 Belmont Pk. N., Dayton, Ohio ..... (1930) 1936
KAY, LAMBDIN, 2332 Delwood Drive, N. W., Atlanta, Ga. 1935
KEALY, MISS LULU, 14 Blackburn Ave., Ottawa, Ont., Can. 1926
KEAYS, JAMES EDWARD, 328 St. George St., London, Ont., Can. 1899
KEEFER, MISS MARY BELLE, 1411 Montana St., El Paso, Texas 1936
KELLOGG, PAUL, 11 Church St., Cortland, N. Y. 1929
KELLY, MRS. GEORGE EARLE, 1311 Grand St., Alameda, Calif. 1929
KELLY, DR. HOWARD ATWOOD, 1406 Eutaw Place, Baltimore, Md. 1934

KELSO, LEON HUGH, 1370 Taylor St., N. W., Washington, D. C. 1929
KENNEDY, DR. HARRIS, Readville 37, Mass. 1916
*KENNEDY, HARRY HOWARD, 230 Stonewall Road, Oakland, Calif. 1920
KENNEDY, HOMER NEY, Box 294, Rosslyn, Va. 1935
KENT, EDWARD GRUET, 9 Highland Ave., Madison, N. J. 1919
KENT, EDWIN CLARK, 80 William St., New York, N. Y. 1907
*KEPNER, CLYDE METZGER, Pikesville Br. P. O., R. D. 7, Baltimore, Md. 1937
KERMODE, FRANCIS, Provincial Museum, Victoria, B. C., Can. 1926
*KIDDER, NATHANIEL THAYER, Milton, Mass. 1906
KILGORE, WILLIAM, JR., Mus. Nat. Hist., Univ. Minn., Minneapolis, Minn. 1906
KILGUS, JOHN FRANK, JR., 422 High St., Williamsport, Pa. 1922
KINCAID, EDGAR, JR., Sabinal, Texas 1936
KING, ALLEN FRENCH, R. D. 3, Manchester, N. H. 1937
KING, LEROY, 1 Cedar St., New York, N. Y. 1901
KINGSLEY, MISS WINIFRED, 522 East Main St., Bellevue, Ohio 1935
KINSEY, ERIC CAMPBELL, 155 Bothin Road (P. O. Box 76), Manor, Marin Co., Calif. 1936
*KIRKHAM, STANTON DAVIS, 152 Howell St., Canandaigua, N. Y. 1910
**KIRKWOOD, FRANK COATES, Phoenix, Baltimore Co., Md. 1892
*KIRN, ALBERT JOSEPH BERNARD, Box 157, Somerset, Texas 1918
KITTREDGE, JOSEPH, JR., Div. Forestry, Univ. California, Berkeley, Calif. 1910
KLAPP, W. P., JR., Deputy Game Protector, Paoli, Pa. 1936
KLOSEMAN, MISS JESSIE EMMA, 60 Charlesgate East, Suite 127, Boston, Mass. 1909
KNAEBEL, ERNEST, 3707 Morrison St., Washington, D. C. 1906
KNAPP, ELMER, R. R. 2, Troy, Pa. 1929
KNAPPEN, MISS PHOEBE MALURA, 2925 Tilden St., N. W., Washington, D. C. 1924
*KNICKERBOCKER, CHARLES KENNEDY, 410 N. Michigan Ave., Chicago, Ill. 1922
KNOWLES, EDWIN HUBERT M., 1104 College Ave., Regina, Sask., Can. 1937
KOBBE, FREDERICK WILLIAM, 1155 Park Ave., New York, N. Y. 1921
KOLB, C[HARLES] HAVEN, JR., 5210 Catalpha Road, Baltimore, Md. 1937
KRAMER, THEODORE CHRISTIAN, Dept. Anat., East Med. Bldg., Ann Arbor, Mich. 1930
KRETZMANN, DR. PAUL EDWARD, 801 DeMun Ave., St. Louis, Mo. 1913
KRUG, HOWARD HENRY, Chesley, Ont., Can. 1932
KUBICHEK, WESLEY FRANK, Biol. Survey, Washington, D. C. 1919
KUERZI, JOHN FRANCIS, 978 Woodycrest Ave., Bronx, New York, N. Y. 1925
KUMMERLOEWE, DR. HANS, Museum für Tierkunde, Dresden, Germany 1928
KUSCHKE, ARTHUR WYNDHAM, JR., 181 N. Franklin St., Wilkes-Barre, Pa. 1935
KUSER, JOHN DRYDEN, 30 Broad St., New York, N. Y. 1910
LADOW, STANLEY VAUGHAN, 56 W. 12th St., New York, N. Y. 1913
LAING, HAMILTON MACK, Comox, B. C., Can. 1917
LAIRD, LONNIE M., 3664 Washington Blvd., St. Louis, Mo. 1937
LAKELA, MRS. OLGA, State Teachers College, Duluth, Minn. 1936
LAMAR, MISS KATE, 1231 39th St., Des Moines, Iowa 1934
LAMB, CHESTER CONVERSE, 235 W. 27th St., Los Angeles, Calif. 1926
LAMBERT, DR. ADRIAN VAN SINDEREN, 168 E. 71st St., New York, N. Y. 1930
LAMBERT, BERT, Allenville, Mich. 1936
LANCELEY, WILLIAM HENRY, 23 Elmdale Ave., Ottawa, Ont., Can. 1926
LANG, EDWARD BALDWIN, 156 Joralemon St., Belleville, N. J. 1935
LANGDON, ROY MONROE, Rt. 5, Box 530, Phoenix, Ariz. 1918

LANGELIER, DR. GUSTAVE ADOLPHE, R. R. 1, Faubourg, St. Jean Baptiste, Que., Can. 1923
LANGSTROTH, JAMES HEIDEL, Silver City, N. M. 1924
LARGE, JOHN WARREN, 44 Clayton Ave., Waynesboro, Pa. 1929
LARGE, DR. W[ALLACE] BRUCE, 6 North Goodman St., Rochester, N. Y. 1933
LARRABEE, PROF. AUSTIN PARK, 306 E. 15th St., Yankton, S. Dak. 1918
LASKEY, MRS. FREDERICK CHARLES, Graybar Lane, Nashville, Tenn. 1933
LASTRETO, CHARLES BARTHOLOMEW, 260 California St., San Francisco, Calif. 1919
LATHAM, ROY, Orient, L. I., N. Y. 1916
LAUCKHART, J. BURTON, 4750 Thackery Pl., Seattle, Wash. 1935
LAUGHLIN, LEDLIE I., Drake's Corner Road, Princeton, N. J. 1936
LAURENT, PHILIP, 31 Mt. Airy Ave., Philadelphia, Pa. 1902
LAWRENCE, ALEXANDER GEORGE, City Health Dept., Winnipeg, Man., Can. 1920
LAWRENCE, ROBERT BOWNE, 411 Westmoreland Ave., Houston, Texas (1883–1900) 1923
LAWSON, RALPH, 88 Washington Sq., East, Salem, Mass. 1917
LEEDY, DANIEL LONEY, Ohio Wildlife Research Station, O.S.U., Columbus, Ohio 1937
LEES, WILLIAM ANDREW DICKSON, Box 138, Wetaskiwin, Alta., Can. 1935
LEFEVRE, RUFUS HARRY, 71 Locust St., Buffalo, N. Y. 1927
LEFFINGWELL, MRS. DANA JACKSON, Cottage Grove, Oregon 1937
LEHRMAN, DANIEL S., 136 W. 168th St., The Bronx, New York 1936
LEISTER, CLAUDE WILLARD, Zoöl. Park, 185th St. & Southern Blvd., New York, N. Y. 1916
LEMON, EARL, West Lorne, Ont., Can. 1935
LEONARD, MISS MARY BEECHER, 30 Barnes St., Providence, R. I. 1930
LERASS, HAROLD J., Pacific Lutheran College, Parkland, Wash. 1937
LERMOND, NORMAN WALLACE, R. F. D. 1, Thomaston, Maine 1921
LEWIS, JOHN BARZILLAI, P. O. Box 853, Amelia, Va. 1924
LEWIS, KENNETH MACKAY, Bear Mountain Trailside Museum, Bear Mt., N.Y. 1937
LEWIS, MERRIAM GARRETSON, Langhorne Place, Salem, Va. 1924
LEWIS, NORMAN, Schuyler Heights, Lake George, N. Y. 1935
LEWY, DR. ALFRED, 2051 E. 72d Place, Chicago, Ill. 1922
LINCOLN, ALEXANDER, JR., 59 Cadman Road, Brookline, Mass 1934
LINFORD, JEAN HULME, 449 Center Ave., Logan, Utah 1937
LINDSEY, DR. ALTON ANTHONY, Biology Dept., American University, Washington, D. C. 1931
LINGS, GEORGE HERBERT, Barciecroft, Didsbury, Manchester, England 1913
LINK, GUSTAVE ADOLPH, JR., Carnegie Museum, Pittsburgh, Pa. 1936
LINTON, M[ORRIS] ALBERT, 315 East Oak Ave., Moorestown, N. J. 1928
LITTLE, MISS MARIAN W., 346 West Baltimore Ave., Media, Pa. 1936
LIVINGSTON, PHILIP ATLEE, 620 Manor Rd., Narberth, Pa. 1927
LLOYD, MRS. WILMOT, 582 Mariposa Ave., Rockcliffe Park, Ottawa, Ont., Can. 1925
LOBODA, LOUIS ANTHONY, Box 135, New Lisbon, Wis. 1935
LOFSTROM, LAWRENCE LEVI, Cambridge, Minn. 1935
LOMAX, DR. CLAUDE, 503 So. Willlow Road, Evansville, Ind. 1933
LONG, GEORGE BAKER, 56 Hawes St., Brookline, Mass. 1935
LONG, HARRY VINTON, 260 Clarendon St., Boston, Mass. 1920
LONG, WILLIAM HENRY, JR., 1612 Morton Ave., Ann Arbor, Mich. 1933
LONG, WILBUR S., 116 East San Rafael Ave., Colorado Springs, Colo. 1935

LONGSTREET, RUBERT JAMES, 610 Braddock Ave., Peninsula Sta., Daytona Beach, Fla. 1923
LÖPPENTHIN, BERNT OVE HARTVIG FABRICIUS, Sondre Fasanvej 31 Itv., Copenhagen F., Denmark 1928
LORD, DR. FREDERIC POMEROY, 39 College St., Hanover, N. H. 1922
LORING, JOHN ALDEN, Owego, Tioga Co., N. Y. 1917
LOTHROP, DR. OLIVER AMES, 101 Beacon St., Boston, Mass. 1920
LOW, ETHELBERT IDE, 256 Broadway, New York, N. Y. 1907
LOW, SETH HASKELL, Des Lacs Waterfowl Refuge, Kenmore, N. D. 1930
LOW, WARWICK JAMES, 4076 Highland Ave., Montreal, Que., Can. 1923
LOWERY, GEORGE HINES, JR., Box 316, Louisiana State University, La. 1934
*LOWNES, ALBERT E., P. O. Box 1531, Providence, R. I. 1924
LUMLEY, ELLSWORTH DUGANNE, Lincoln High School, Seattle, Wash. 1933
LUNN, WILLIAM HERBERT, Hillier, Ont., Can. 1935
LUTHY, FERD., JR., 306 N. Institute, Peoria, Ill. 1937
LUTTRINGER, LEO AMOS, Board Game Commissioners, Harrisburg, Pa. 1937
LYMAN, CHARLES PEIRSON, R. D. 1, Canton, Mass. 1937
LYNCH, JOHN JOSEPH, Biological Survey, Pilot Town, La. 1937
LYON, ALLAN MATTHEW, Port Hardy, B. C., Can. 1937
LYON, DR. MARCUS WARD, JR., 214 La Porte Ave., South Bend, Ind. 1922
MAC BRIAR, WALLACE, JR., 3905 N. Shepard Ave., Milwaukee, Wis. 1937
MACCLOSKEY, JAMES EDWARD, JR., 1712 Farmers Bank Bldg., Pittsburgh, Pa. 1937
MACCOY, CLINTON VILAS, Boston Soc. Nat. Hist., 234 Berkeley St., Boston, Mass. 1920
MACCRACKEN, DR. WALTER H., Wayne Univ. College of Medicine, 1516 St. Antoine St., Detroit, Mich. 1931
MACK, HORACE GORDON, Guelph, Ont., Can. 1933
MACKAYE, JAMES, 6 College St., Hanover, N. H. 1921
MACKIE, REV. AUGUSTINE CLARK, Vernon, B. C., Can. 1937
MACKWORTH-PRAED, CYRIL WINTHROP, Dalton Hill, Albury, Surrey, England. 1928
MACLAY, MARK WALTON, JR., 44 Wall St., New York, N. Y. 1905
MACLEAN, MISS DOROTHY WILLIAMS, 245 Grandview Terr., Hartford, Conn. 1931
MACLOGHLIN, MRS. FFORDE EDWARD, 43 Inglewood Drive, Hamilton, Ont., Can. (1923) 1926
MACLULICH, DR. DUNCAN ALEXANDER, 144 Mavety St., Toronto 9, Ont., Can. 1931
MACREYNOLDS, GEORGE, Doylestown, Pa. 1937
**MADDOCK, MISS EMELINE, The Marchwood, 5575 Wissahickon Ave., Germantown, Philadelphia, Pa. 1897
MADISON, HAROLD LESTER, Director Cleveland Mus. Nat. Hist., 2717 Euclid Ave., Cleveland, Ohio 1912
MAGEE, MICHAEL JARDEN, 603 South St., Sault Ste. Marie, Mich. 1919
MAGUIRE, WALTER STANLEY, Y. M. C. A., New Westminster, B. C., Can. 1935
MAHER, JOHN EDWARD, 279 Pacific Ave., Jersey City, N. J. 1902
MAIN, JOHN SMITH, 2210 Van Hise Ave., Madison, Wis. 1926
MALCOMSON, HERBERT THOMAS, Glenorchy, Hawthornden Rd., Knock, Belfast, N. Ireland 1928
MALLEY, PHILIP PATRICK, Box 6, Nunhall, Pa. 1934
MANGELS, FREDERICK PAUL, 2047 Nostrand Ave., Apt. 504, Brooklyn, N. Y. 1935
MANIGAULT, EDWARD, Box 131, Route 1, Charleston, S. C. 1931
MANLEY, CALVERT HAMILTON, 649 Ridge Ave., New Kensington, Pa. 1936

MAPLES, ASHLEY KILSHAW, 33 London Road, Spalding, England.....1928
MARBLE, RICHARD MERRILL, Woodstock, Vt.....1907
MARBURGER, CLIFFORD, Denver, Pa.....1923
MARCOTTE, REV. LEON, St. Charles Seminary, Sherbrooke, Que., Can.....1921
MARDEN, AARON, R. D. 7, Augusta, Maine.....1924
MARESI, POMPEO M., 9 Reimer Rd., Scarsdale, N. Y.....1929
MARSH, VERNON L., Botany Dept., Univ. Washington, Seattle, Wash.....1937
MARSHALL, ALAN JOHN, "Glen Ayr," 152 Penshurst St., Penshurst, N.S.W.....1934
*MARSHALL, MRS. ELLA MARIA ORMSBY, New Salem, Mass.....1912
MARSHALL, RAYMOND OSCAR, c/o Ralph Walter, R. D. 4, Lisbon, Ohio.....1932
MARSHALL, MRS. WATSON, 5521 Dunmoyle St., Pittsburgh, Pa.....1937
MARSHALL, WILLIAM HAMPTON, U. S. Biol. Surv., Utah State College, Logan, Utah.....1935
MASLOWSKI, KARL HERBERT, 950 Glenwood Ave., Cincinnati, Ohio.....1935
MASON, CHARLES RUSSELL, Box 861, Sanford, Fla.....1936
MASON, GEORGE CARRINGTON, 1015 Blair Ave., Hampton, Va.....1933
MASON, ROBERT FRENCH, JR., 2415 California St., N. W., Washington, D. C..1929
MASON, MISS ROSALIE, c/o J. S. Mason, Route 5, Thomasville, Ga.....1928
MASURE, RALF HERBERT, Hyde Park Manor Hotel, 5510 Harper Ave., Chicago, Ill.....1936
MATHEWS, FERDINAND SCHUYLER, 17 Frost St., Cambridge, Mass.....1917
MATHEWS, DR. FRANK PELLETREAU, Main St., Southport, Conn.....1923
MAY, FRANKLIN HINSDELL, Biol. Survey, Washington, D. C.....1937
MAYAUD, NOEL, 1 rue de Bordeaux, Saumur, Maine et Loire, France.....1927
MAYER, JOHN, 122-67 134th St., South Ozone Park, L. I., N. Y.....1936
MAYER, KARL R., Box 497, Cleveland, Tenn.....1936
MAYFIELD, DR. GEORGE RADFORD, Calhoun Hall, Nashville, Tenn.....1917
MAYNARD, DR. EDWIN POST, JR., 200 Hicks St., Brooklyn, N. Y.....1933
MAYNARD, DR. HERBERT ERNEST, 464 Commonwealth Ave., Boston, Mass....1921
MCCABE, THOMAS TONKIN, 2620 Parker St., Berkeley, Calif.....1920
MCCALL, WILLIAM WHITE, 721 Millbrook Lane, Haverford, Pa.....1921
MCCANN, HORACE DOLBEY, Valley Road, Paoli, Pa.....1923
MCCLANAHAN, ROBERT CHARLES, 1700 E. Avery St., Pensacola, Fla.....1936
MCCONNELL, MISS MARY LOU, 151 Center Ave., Bellevue Sta., Emsworth, Pa.1936
**MCCOOK, HON. PHILIP JAMES, Supreme Court, New York, N. Y.....1895
MCCORMICK, DR. DONALD J., 301 West 7th St., Chester, Pa.....1936
MCCORMICK-GOODHART, LEANDER, Langley Park, Silver Spring, Md.....1927
MCCOY, HERBERT N[EWBY], 1226 Westchester Place, Los Angeles, Calif.....1930
MCCREARY, OTTO, Agr. Hall, Univ. Wyoming, Laramie, Wyo.....1932
MCCULLAGH, DR. ERNEST PERRY, Cleveland Clinic, 2020 E. 93d St., Cleveland, Ohio.....1934
MCDONALD, NORMAN JOHN, 8341 Germantown Ave., Chestnut Hill, Philadelphia, Pa.....1935
MCDOUGALL, ERIC GRAHAM, Roy. Ontario Mus. Zoöl., 100 Queen's Park, Toronto, Ont., Can.....1933
MCGAHEY, MISS HONORA PEARL, 193 O'Connor St., Ottawa, Can.....1926
MCGRAW, HARRY A., 1600 5th Ave., Altoona, Pa.....1936
**MCILHENNY, EDWARD AVERY, Avery Island, La.....1894
MCILWAINE, DR. W[ILLIAM] BAIRD, JR., 208 S. St. Asaph St., Alexandria, Va..1933
MCILWRAITH, THOMAS FORSYTH, 50 St. Leonard's Ave., Toronto 12, Ont., Can. 1933

McKENNY, Miss MARGARET, Am. Mus. Nat. Hist., New York, N. Y. 1926
McKITTRICK, THOMAS HARRINGTON, JR., Coombe Place, East Grinstead, Sussex, England 1928
**McLAIN, ROBERT BAIRD, P. O. Box 132, Hollywood Sta., Los Angeles, Calif. 1893
McLAUGHLIN, GEORGE, Washington High School, Massillon, Ohio 1937
McLEAN, DONALD DUDLEY, 101 E. St. James St., San José, Calif. 1930
McLENNAN, JAMES PIRRIE, Box 143, Ossining, N. Y. 1935
McMANUS, REID, JR., Memramcook, New Brunswick, Can. 1930
McMASTER, MRS. WILLIAM DAVID, 1030 S. State St., Belvidere, Ill. 1935
McMILLAN, NEIL TAYLOR, 2130 Belvedere Ave., S. W., R. D. 4, Box 63, Atlanta, Ga. 1937
McMURTREY, M. S., Soil Conservation Service, Rapid City, S. Dak. 1937
McNEIL, DR. CHARLES ANDREW, 111½ West 4th St., Sedalia, Mo. 1919
McNUTT, Miss DOROTHEA ROSALIE, Greensboro College, Greensboro, N. C. 1930
McQUISTON, HOWARD MEDE, 372 Jefferson Ave., Sharon, Pa. 1934
MEAD, MRS. ELDORA MEHITABLE, 51 E. 78th St., New York, N. Y. 1904
MEADE, DR. GORDON MONTGOMERY, Trudeau Sanitorium, Trudeau, N. Y. (1921–23) 1936
MEANLEY, M[ORTIMER] BROOKE, 4710 Keswick Rd., Roland Park, Baltimore, Md. 1935
MEANS, ROBERT WHITMAN, 45 Vernon St., Brookline, Mass. 1932
MEANS, WILLIAM MARTIN, 36 Meeting St., Charleston, S. C. 1937
MELCHER, MRS. CHARLES WOODBURY, Homosassa Springs, Fla. 1922
MENDALL, HOWARD, 28 Pendleton St., Brewer, Maine 1934
MENGEL, GEORGE HENRY, 739 Madison Ave., Reading, Pa. 1913
MEREDITH, REX, 121 Monckton Ave., Quebec, Can. 1927
MEREDITH, CAPT. RUSSELL LUFF, Boonton, N. J. 1933
*MERSHON, WILLIAM BUTTS, Saginaw, Mich. 1905
MESSER, DON VINAL, Huntington, Mass. 1924
METCALF, DR. ZENO PAYNE, State College Station, Raleigh, N. C. 1913
*MEYER, Miss HELOISE, Lenox, Mass. 1913
MEYER, WILLIAM HENRY KARLSRUH, 5508 Locust St., Philadelphia, Pa. 1933
MICHENER, HAROLD, 418 N. Hudson Ave., Pasadena, Calif. 1926
MICKEY, ARTHUR BAYARD, Zool. Dept., Univ. of Wyoming, Laramie, Wyo. 1936
MIDDLETON, RAYMOND JONES, Marshall St. and Whitehall Road, Norristown, Pa. 1920
MILLER, Miss BERTHA STUART, Capstone Farm, R. 3, Kingston, N. Y. 1915
MILLER, HOWARD BURNETT, 4 High St., Turners Falls, Mass. 1935
MILLER, J[OHN] PAUL, Biol. Surv., Washington, D. C. 1932
MILLER, RICHARD, Dennison, Iowa 1937
MILLER, ROBERT CUNNINGHAM, Dept. Zoöl., Univ. Wash., Seattle, Wash. 1935
MILLS, DUDLEY HOLBROOK, Glen Head, L. I., N. Y. 1929
MILLS, MRS. WILFRID GORDON, 84 Roxborough St., E., Toronto, Ont., Can. 1937
MILNES, Miss HARRIET KERNAHAN, 331 Gowen Ave., Mt. Airy, Philadelphia, Pa. 1934
MITCHELL, HAROLD DIES, 378 Crescent Ave., Buffalo, N. Y. 1930
MITCHELL, HORACE HEDLEY, 1232 15th Ave., Regina, Sask., Can. ..... (1913–15) 1918
MITCHELL, MRS. OSBORNE SINDEN, Apt. 8, 69 Oriole Rd., Toronto, Ont., Can. 1928
**MITCHELL, DR. WALTON IUNGERICH, 1644 Visalia St., Berkeley, Calif. 1893
MOLL, Miss LENO, 3601 Trinity St., Eureka, Calif. 1937

MOLONEY, LAWRENCE J., JR., 18600 Mussland Ave., Detroit, Mich. 1936
MOLONY, CHARLES EDMUND GIBSON, 43 Willowbank Blvd., Toronto, Ont., Can. 1935
MONK, HARRY CRAWFORD, 3108 Long Blvd., Nashville, Tenn. 1921
MONROE, BURT LEAVELLE, 207 N. Birchwood Ave., Louisville, Ky. 1935
MONSON, GALE, 311 East Green St., Gallup, N. Mex. 1937
MOODY, ADELBERT JOHN, c/o Aetna Life Ins. Co., Hartford, Conn. 1918
MOORE, HARVEY, 102 Rex Ave., Chestnut Hill, Philadelphia, Pa. 1937
MOORE, JAMES RICHARDS, Drawer 239, Hartford, Conn. 1937
MOORE, WILLIAM G., 257 King's Highway, West, Haddonfield, N. J. 1937
MORE, ROBERT LEE, 1905 Wilbarger St., Vernon, Texas ..... (1911–15) 1921
MOREHOUSE, BEAUMONT JOHN, Forestby, Branchville, Conn. 1926
MORELAND, GEORGE EDWARD, 110 Cook St., Ithaca, N. Y. 1937
MOREY, MRS. LILLIAN DAME, 6 Pinehurst Circle, Chevy Chase, Md. 1924
*MORGAN, JOHN SAGE, 27 Circuit Road, Chestnut Hill, Mass. 1927
MORRELL, DR. ARCH HIRAM, 210 Maine Ave., Gardiner, Maine 1923
MORRILL, RALPH EVERETT, 1217 Olivia Ave., Ann Arbor, Mich. 1936
MORRISON, ALASTAIR ROBIN GWYN, The Oaks, Paddockhall Road, Haywards Heath, Sussex, England 1934
MORRISON, ALVA, 100 Milk St., Boston, Mass. 1915
MORSE, MISS MARGARETTE ELTHEA, 11432 Mayfield Rd., Cleveland, Ohio 1919
MOSELEY, CHARLES BARBER, 116 Oak Ave., Ithaca, N. Y. 1937
MOSELEY, PROF. EDWIN LINCOLN, Bowling Green, Ohio 1918
MOSTOLLER, RALPH VICKROY, Stoystown, Pa. 1936
MOULTON, FRANCIS SEVERN, 215 Canton Ave., Milton, Mass. 1926
MOYER, JOHN WILLIAM, Field Mus. Nat. Hist., Chicago, Ill. 1928
MUELLER, WALTER JOSEF, 3043 North Prospect Ave., Milwaukee, Wis. (1928–30) 1934
MUNN, CAPT. PHILIP WINCHESTER, Puerto Alcudia, Majorca, Balearic Isles, Spain 1929
MUNTER, CAPT. WILLIAM HENRY, U. S. Coast Guard, 806 Wilkins Bldg., Washington, D. C. 1927
MURDOCK, EARLE C., Soil Conservation Service, Le Roy, Ill. 1937
MURIE, DR. ADOLPH, 300 Keeline Bldg., Omaha, Nebr. 1931
MURPHEY, DR. EUGENE EDMUND, 432 Telfair St., Augusta, Ga. ..... (1919–23) 1934
MURPHY, MRS. GRACE EMELINE BARSTOW, 45 Oriole Ave., Bronxville, N. Y. 1919
MURPHY, PAUL, 53 New England Ave., Summit, N. J. 1934
MUSGRAVE, DR. JOHN KNOX, 350 Parkway Drive, Pittsburgh, 16, Pa. 1936
MUSSELMAN, THOMAS EDGAR, 124 S. 24th St., Quincy, Ill. 1922
MYERS, MRS. BENJAMIN FRANKLIN, 7716 Navajo St., Chestnut Hill, Philadelphia, Pa. 1902
MYERS, MRS. HARRIET WILLIAMS, 311 N. Ave. 66, Los Angeles, Calif. 1906
MYRLAND, ARTHUR LUCIUS, Magdalena, New Mexico 1936
NAUMBURG, WALTER WEHLE, 121 E. 64th St., New York, N. Y. 1923
*NEELY, JAMES COLUMBUS, 135 High St., Brookline, Mass. 1919
NEELY, WILLIAM W., 149 West End St., Chester, S. C. 1936
NEFF, JOHNSON ANDREW, P. O. Box 1317, Sacramento, Calif. 1919
NELLES, ARTHUR, 223 McLeod St., Ottawa, Ont., Can. 1935
NELSON, ARNOLD LARS, Biol. Survey, Washington, D. C. 1931
NELSON, MARTIN KNUTE, State Game Warden, Fertile, Minn. 1937

NELSON, MISS THEODORA, 2695 Heath Ave., Bronx, New York, N. Y. 1927
NEWBOLD, CLEMENT BIDDLE, Gate Farm, Jenkintown, Pa. 1929
NEWELL, MRS. H. S., Board of Trade Bldg., Duluth, Minn. ..... (1912–18) 1926
NEWMAN, THOMAS HENRY, 46 Forty Avenue, Wembley Park, Middlesex, England 1936
NICHOLS, CHARLES KETCHAM, 212 Hamilton Rd., Ridgewood, N. J. 1931
NICHOLS, MRS. CHARLES KETCHAM, 212 Hamilton Rd., Ridgewood, N. J. 1933
NICHOLS, LEON NELSON, 315 E. 68th St., New York, N. Y. 1917
NICHOLS, ROBERT ASHCRAFT, Charlotte Amalie, St. Thomas, Virgin Ids., W. I. 1937
NICHOLS, RODMAN ARMITAGE, 7 S. Pine St., Salem, Mass. 1919
NIEDERAUR, FRANK LEE, JR., 322 So. Lynn St., Bryan, Ohio 1936
NININGER, PROF. HARVEY HARLOW, 1955 Fairfax St., Denver, Colo. 1920
NOLAN, THOMAS BRENNAN, U. S. Geol. Survey, Washington, D. C. 1935
NORRIS, EDWARD, 301 W. Springfield Ave., Philadelphia, Pa. 1916
NORTH, GEORGE WEBSTER, 249 Charlton St., West, Hamilton, Ont., Can. 1935
OASTLER, MRS. FRANK RICHARD, 1192 Park Ave., New York, N. Y. 1937
O'BRIEN, MISS ISABEL CAMPION, 16 Rosehill Ave., Toronto 5, Ont., Can. 1937
O'BRIEN, MISS MARY, Apt. 411, 200 Mass. Ave., N.W., Washington, D. C. 1936
ODUM, EUGENE PLEASANTS, Biol. Lab., Western Reserve Univ., Cleveland, Ohio 1932
OEHLENSCHLAEGER, MISS ELIZABETH AUGUSTE, The Hammocks, Sta. C, Route 6, Milwaukee, Wis. 1934
OEHSER, PAUL HENRY, U. S. National Museum, Washington, D. C. 1925
OLIVIER, GEORGES, 6 rue Chas. Flavigny, Elbeuf, Seine Inférieure, France 1935
OLSEN, HUMPHREY ADONIRAM, 172 Manchester St., Battle Creek, Mich. 1930
OLSEN, DR. RICHARD ELLSWORTH, St. Joseph Mercy Hospital, Pontiac, Mich. 1930
ORR, DR. ROBERT THOMAS, Calif. Academy Sciences, Golden Gate Park, San Francisco, Calif. 1937
ORTH, JOHN C., 324 Marbledale Road, Tuckahoe, N. Y. 1936
OSLER, GLYN FEATHERSTON, 360 St. James St., Montreal, Que., Can. 1934
OVERING, ROBERT, Landover, Md. 1929
*OWEN, MISS JULIETTE AMELIA, 306 N. 9th St., St. Joseph, Mo. 1897
OWRE, OSCAR, JR., 2625 Newton Ave. So., Minneapolis, Minn. 1934
*PACK, ARTHUR NEWTON, Ghost Ranch, Abiquin, N. Mex. 1929
PACKARD, FRED MALLERY, Emergency Conservation Committee, 734 Lexington Ave., New York, N. Y. 1935
PAFF, WILLIAM ALFRED, 916 Paxinosa Ave., Easton, Pa. 1927
PAGE, DONALD, Orange, Conn 1937
**PAINE, AUGUSTUS GIBSON, JR., 31 E. 69th St., New York, N. Y. 1886
*PALMER, MISS ELIZABETH DAY, 1741 S. Harvard Blvd., Los Angeles, Calif. ..1918
PALMER, RALPH SIMON, Route 1, Box 11, Brunswick, Maine 1932
PALMER, DR. SAMUEL COPELAND, Swarthmore College, Swarthmore, Pa. 1899
PALMER, MRS. THEODORE SHERMAN, 1939 Biltmore St., N. W., Washington, D. C. 1918
PANGBURN, CLIFFORD HAYES, Chappaqua, N. Y. 1907
PARK, CHARLES FREDERICK, JR., U. S. Geol. Survey, Washington, D. C. 1936
*PARKER, EDWARD LUDLOW, Nashawtuc Road, Concord, Mass. 1916
PARKER, HARRY CLARENCE, Mus. Nat. Hist., 12 State St., Worcester, Mass. ..1927
PARKER, HERBERT, South Lancaster, Mass. 1920
PARKER, KENNETH, 1000 Milwaukee Ave., Janesville, Wis. 1936
PARRISH, MORRIS LONGSTRETH, 212 So. 15th St., Philadelphia, Pa. 1937

PARRY, EDWARD HICKS, Box 84, Wyncote, Pa. 1929
PARTRIDGE, MISS SARAH WARING, Fla. Comm. Game, State Capitol, Tallahassee, Fla. 1936
PATERSON, LESLIE STEWART, 210 3rd St., N., Kenmore, Ont., Can. 1937
PATTEN, DR. STEPHEN KERR, 141 Milk St., Boston, Mass. 1920
PATTERSON, JOHN ELLIOT, 335 Giannini Hall, Univ. Calif., Berkeley, Calif. 1929
PATTIE, PROF. FRANK ACKLEN, JR., Rice Institute, Houston, Texas 1936
PAUL, LUCIUS H., 424 Carter St., Rochester, N. Y. 1908
PEABODY, REV. PUTNAM BURTON, 2011 Park Ave., Topeka, Kans. 1903
PEAKE, ARTHUR LIONEL, Nanaimo, B. C., Can. 1927
PEARSALL, GORDON SAWYER, Field Museum, Chicago, Ill. 1931
PEARSE, THEED, P. O. Box 158, Courtenay, Vancouver Id., B. C., Can. (1907) 1926
PEASE, MISS FLORENCE MABEL, Box 265, Conway, Mass. 1922
PEET, DR. MAX MINOR, 2030 Hill St., Ann Arbor, Mich. 1933
PELL, STUYVESANT MORRIS, 324 Dryden Rd., Ithaca, N. Y. 1932
PELLEW, MISS MARION JAY, "The Heights," Aiken, S. C. 1919
PEMBERTON, JOHN ROY, 3031 N. Lake Ave., Altadena, Calif. 1918
PENNOCK, DR. WINTHROP, 713 East Genesee St., Syracuse, N. Y. 1931
PEPPER, DR. WILLIAM, Melrose Park, Philadelphia, Pa. 1911
PEPPER, WILLIAM, JR., 110 Glenview Ave., Wyncote, Pa. 1930
PERINE, KEBLE BARNUM, 242 Islington Rd., Auburndale, Mass. 1917
*PERKINS, DR. ANNE ELIZABETH, Box 414, North Berwick, Maine 1917
PERKINS, DR. EDWARD HENRY, Box 52, Colby College, Waterville, Maine 1920
PERKINS, IRVING JAMES, Public Museum, Milwaukee, Wis. 1935
PERKINS, SAMUEL ELLIOTT, 3D, 709 Inland Bldg., Indianapolis, Ind. 1923
PERRY, EDGAR LEROY, State Game and Fish Warden, Santa Fé, N. M. 1928
PERRY, GEORGE LEWIS, 68 Thurston St., Winter Hill, Somerville, Mass. 1923
PERRY, JOHN ELMER, 956 W. 28th St., Erie, Pa. 1924
PERRY, THOMAS, JR., 2 Margin St., Westerly, R. I. 1936
PETERKIN, FREDERICK PEMBROKE, Kendal, St. John, Barbados, B. W. I. 1933
PETERS, ALBERT S., Donnybrook, N. Dak. 1908
PETERS, HAROLD SEYMOUR, U. S. Biol. Survey, Washington, D. C. 1924
PETERSON, ALFRED, Box 211, Pipestone, Minn. 1920
PETERSON, NELS THEODORE, 80 Oaklawn Ave., Battle Creek, Mich. 1931
PFEIFFER, EGBERT W., 2 Central Ave., Ithaca, N. Y. 1937
PHELPS, FRANK MILLS, 312 5th St., Elyria, Ohio 1912
PHELPS, JAMES H[ARVEY], 1319 24th St., Ogden, Utah 1933
PHELPS, MRS. JOHN WOLCOTT, Box 158, Northfield, Mass. 1899
PHELPS, WILLIAM H., Apartado 2009, Caracas, Venezuela 1937
*PHILIPP, PHILIP BARNARD, 220 Broadway, New York, N. Y. 1907
PHILLIPS, ALLAN ROBERT, 113 Olive Rd., Tucson, Ariz. 1932
**PHILLIPS, PROF. ALEXANDER HAMILTON, 54 Hodge Road, Princeton, N. J. 1891
PHILLIPS, CASSIUS ALVIN, 659 Euclid Ave., Elmira, N. Y. 1937
PHILLIPS, CHARLES LINCOLN, 5 West Weir St., Taunton, Mass. 1912
*PHILLIPS, JOHN MACFARLANE, 2227 Jane St., Pittsburgh, Pa. 1920
PHINIZY, DR. IRVING, 753 Broad St., Augusta, Ga. 1933
PICKENS, ANDREW LEE, Paducah Jr. College, Paducah, Ky. 1925
PICKWELL, GAYLE BENJAMIN, Natural Science Dept., State Teachers Coll., San Jose, Calif. 1924
PIGGOT, JOHN WHITMAN, Bridgetown, N. S., Can. 1927

*Pike, Eugene Rockwell, 2430 Lake View Ave., Chicago, Ill. 1926
*Pinchot, Hon. Gifford, 1615 Rhode Island Ave., N. W., Washington, D. C. 1910
Pitelka, Frank Alois, 7337 Ogden Ave., Lyons, Ill. 1937
Platford, Sidney D., 4166 Fifth Ave., Los Angeles, Calif. 1937
Plath, Karl, 2847 Giddings St., Chicago, Ill. 1925
Platt, Charles, Jr., Morris Road, Ambler, Pa. 1930
Platt, Hon. Edmund, 124 Whitehall Blvd., Garden City, L. I., N. Y. 1917
Poe, Miss Margaretta, Earl Court, St. Paul & Preston Sts., Baltimore, Md. 1899
Poland, J[ames] Lloyd, 526 W. Burke St., Martinsburg, W. Va. 1935
Pomeroy, Fred Elmer, Dept. Biology, Bates College, Lewiston, Maine 1920
Pönitz, Studienrat Hans, Frankfurterstr. 2, Leipzig, Germany 1929
Poole, Earl Lincoln, Public Museum, Reading, Pa. 1916
Poole, Frazer Glendon, Federalsburg, Maryland 1934
*Poor, Hustace Hubbard, 112 Park Ave., Yonkers, N. Y. 1934
**Porter, Louis Hopkins, Noroton Hill, Stamford, Conn. 1893
Porter, Thomas Wayne, 324 Water St., Oak Harbor, Ohio 1937
Porter, Willard Brown, 5 Lee St., Salem, Mass. 1922
Pothier, Israel Joseph, Lower Wedgeport, Yarmouth Co., Nova Scotia, Can. 1933
Potter, Miss Jessica Avice, 1118 Santee St., Los Angeles, Calif. 1924
Potter, Julian Kent, 437 Park Ave., Collingswood, N. J. 1912
Potter, Laurence Bedford, Gower Ranch, East End, Sask., Can. 1919
Potter, Louis Henry, R. F. D. 2, West Rutland, Vt. 1922
Potts, Frederick Andrew, Enseñada, Puerto Rico 1922
**Praeger, William Emilius, Kalamazoo College, Kalamazoo, Mich. 1892
Pratt, Delbert Randall, McKinley High School, Canton, Ohio 1932
Preble, Norman Alexander, 73 Prospect St., Wakefield, Mass. 1937
Prescott, Mrs. Samuel Cate, 249 Tappan St., Brookline, Mass. 1922
Presnall, Clifford Charles, 6335 Ridge Dr., Sta. A., Washington, D. C. 1933
Preston, Charles Putnam, Baynesville, Va. 1936
Preston, Ralph Clausius, Bronxville Public School, Bronxville, N. Y. 1936
Price, John Basyl, 532 Alvarado St., Stanford University, Calif. 1931
Price, Dr. Ligon, Dunmore, W. Va. 1913
Priest, Capt. Cecil Damer, Wedza, Marandellas, S. Rhodesia, S. Africa 1927
Prill, Dr. Albert G., Scio, Oregon 1921
Primley, Walter S., 222 West Adams St., Chicago, Ill. 1934
*Procter, Mrs. Lillian Sanford, New Ashford, Lanesboro P. O., Mass. 1928
Proctor, George Newton, 250 Beacon St., Boston, Mass. 1919
*Proctor, William, 430 Park Ave., New York, N. Y. 1928
Puckett, Oliver Kent, Keno, Oregon 1937
Purdie, Miss Evelyn, 33 Whitefield Hall, 19 Garden St., Cambridge, Mass. 1921
Purdy, William Brown, Box 114, Milford, Oakland Co., Mich. 1921
Putman, William Lloyd, Entomological Laboratory, Vineland Station, Ont., Can. 1937
Quarles, Emmet Augustus, 139 E. 7th St., Plainfield, N. J. 1918
Quattlebaum, Rev. William Daniel, 1925 Paloma St., Pasadena, Calif. 1924
Quillin, Roy W., 422 West King's Highway, San Antonio, Texas 1920
Racey, Kenneth, 3262 West First Ave., Vancouver, B. C., Can. 1921
Rand, Austin Loomer, Am. Mus. Nat. Hist., New York, N. Y. (1927–30) 1934
Ranlett, Mrs. Louis Felix, 60 Montgomery St., Bangor, Maine 1931
Ransom, Webster Hamilton, 708 W. 20th Ave., Spokane, Wash. 1927

RAPP, FREDERICK WILLIAM, 125 E. Prairie St., Vicksburg, Mich. 1922
RAPRAEGER, ELMER FREDERICK, Forest Service, Missoula, Mont. 1935
RAY, SAMMIE M., Rosedale, Miss. 1937
*RAYMOND, OLNEY MARTIN, 209 Lincoln Pl., Brooklyn, N. Y. 1930
RAYNOR, GILBERT SIDNEY, Manorville, N. Y. 1937
RAZ, GEORGE FRANCIS, Box 83, Union Pier, Mich. 1931
REA, GENE, 2378 Neil Ave., Columbus, Ohio 1937
**REAGH, DR. ARTHUR LINCOLN, 39 Maple St., West Roxbury, Mass. 1896
REBELL, GERBERT, 188 Morris Ave., Summit, N. J. 1937
REDD, LEONARD, 2413 Mason St., Flint, Mich 1931
REED, MRS. CHARLES KELLER, 11 State St., Worcester, Mass. 1925
REED, MISS CLARA EVERETT, New Braintree, Mass. 1919
REESE, MRS. ROBERT MILLER, 517 Cameron St., Alexandria, Va. 1920
REGAR, GEORGE BERTRAM, Copewell House, Rydal, Pa. 1923
REGAR, HOWARD SEVERN, Summit Drive, Anniston, Ala. 1916
REHN, JAMES ABRAM GARFIELD, Acad. Nat. Sci., Philadelphia, Pa. 1901
REICH, MRS. FRANK A., Lake Tomahawk State Camp, Lake Tomahawk, Wis. 1937
REID, MRS. BRUCE, Gulf Refinery, Port Arthur, Texas 1918
REUSS, ALFRED HENRY, JR., 12910 S. Mozart St., Blue Island, Ill. 1933
REYNOLDS, KEITH, 3 McDonald Ave., London, Ont., Can 1937
**RHOADS, CHARLES JAMES, Bryn Mawr, Pa. 1895
**RHOADS, SAMUEL NICHOLSON, 81 Haddon Ave., Haddonfield, N. J. 1885
RICE, JAMES HENRY, JR., Brick House Plantation, Wiggins, S. C. 1910
RICE, WARD JENNINGS, 5250 N. Pennsylvania St., Indianapolis, Ind. 1913
RICH, MARCUS CHARLES, 92 Morningside Ave., New York, N. Y. 1931
RICHARDS, MISS HARRIET ELIZA, 36 Longwood Ave., Brookline, Mass. 1900
RICHARDS, MISS RUTH, Clifton Sta., Fairfax Co., Va. 1921
RICHARDS, TUDOR, Joy's Lane, Groton, Mass. 1934
RICHARDSON, FRANK, 3616 Main St., Riverside, Calif. 1935
RICHARDSON, GEORGE HUBERT, 182 Rusholme Road, Toronto, Ont., Can. 1934
RICHARDSON, MISS JULIET, Boston Society Natural History, 234 Berkeley St., Boston, Mass. 1937
RICHARDSON, WILLIAM B., R. D. 2, Box 1170, Porterville, Calif. 1936
RICHARDSON, WILLIAM DERRICK, 4215 Prairie Ave., Chicago, Ill. 1917
*RICHARDSON, MRS. WILLIAM DERRICK, 4215 Prairie Ave., Chicago, Ill. 1925
RICHARDSON, DR. WYMAN, 229 Dudley Road, Newton Centre, Mass. 1920
**RIDGWAY, JOHN LIVZEY, 635 No. Pacific Ave., Glendale, Calif. 1890
**RIKER, CLARENCE BAYLEY, 432 Scotland Road, South Orange, N. J. 1885
RITTER, DR. WILLIAM EMERSON, Univ. California, Berkeley, Calif. 1929
*ROADS, MISS KATIE MYRA, 463 Vine St., Hillsboro, Ohio 1929
ROBB, DUNBAR, 120 Wentworth St., Charleston, S. C. 1937
ROBBINS, CHANDLER, JR., 124 Wentworth Ave., Wyoming, Ohio 1934
ROBERTS, HOWARD RADCLYFFE, Villa Nova, Pa. 1924
ROBERTS, WILLIAM ELY, 207 McKinley Ave., Lansdowne, Pa. 1902
ROBERTSON, HOWARD, 157 S. Wilton Drive, Los Angeles, Calif. 1911
ROBERTSON, JOHN MCBRAIR, Box 121, Buena Park, Orange Co., Calif. 1920
ROBINSON, ANTHONY WAYNE, 780 College Ave., Haverford, Pa. 1903
ROBINSON, CHARLES BONNYCASTLE, JR., Georges Mills, N. H. 1935
ROBINSON, HERBERT WILLIAM, 37 West Road, Lancaster, England 1928
ROBINSON, MISS RACHEL GORGAS, 780 College Ave., Haverford, Pa. 1928

ROCKEFELLER, J. S., 791 Park Ave., New York, N. Y. 1935
RODGERS, NORMAN IVERS, 1557 Pine Ave., Trail, B. C., Can. 1937
ROGERS, CYRIL HAROLD, 4 Mill Road, Cambridge, Eng. 1931
ROGERS, MISS MABEL FLORENCE, 11 Fourth Ave., Ottawa, Ont., Can. 1921
ROGERS, MISS MABEL TITSWORTH, 200 Columbia St., Milledgeville, Ga. 1934
ROGERS, REV. WALLACE, 535 Page Ave., N.E., Atlanta, Ga. 1921
ROGERS, MRS. WALTER E., 911 E. North St., Appleton, Wis. 1932
ROGERS, PROF. WALTER E., 911 E. North St., Appleton, Wis. 1935
ROLAND, CONRAD KESSLER, 4226 Parkside Ave., Philadelphia, Pa. 1917
**ROOSEVELT, HON. FRANKLIN DELANO, The White House, Washington, D. C. 1896
ROSENE, WALTER MELVIN, P. O. Box 22, Ogden, Iowa 1928
ROSIER, EUGENE, Petit Saconnex, Geneva, Switzerland 1927
ROSS, MISS BLANCHE, Morganton, N. C. 1937
ROSS, CHARLES CHANDLER, 7924 Lincoln Drive, Chestnut Hill, Pa. 1936
ROSS, GEORGE HERBERT, 23 West St., Rutland, Vt. 1904
ROSS, HOLLIS TREVOR, 109 So. 3d St., Lewisburg, Pa. 1931
ROSS, DR. LUCRETIUS HENRY, 507 Main St., Bennington, Vt. 1912
ROSS, REUBEN JAMES, 63 Wall St., New York, N. Y. 1922
ROSS, ROLAND CASE, 1820 Bushnell Ave., South Pasadena, Calif. 1925
ROSSIGNOL, GILBERT RICE, 1321 East 33d St., Savannah, Ga. 1928
ROUSE, REGINALD FREDERICK, 105 New St., Birmingham, England 1935
ROWLEY, JOHN STUART, 424 N. Valencia St., Alhambra, Calif. 1930
ROYALL, JORDAN BROOKS, Tallahassee, Fla. 1928
RUBEY, WILLIAM WALDEN, U. S. Geological Survey, Washington, D. C. 1934
RUBY, GEORGE DALLAS, 520 Clarendon St., Syracuse, N. Y. 1928
RUFF, FREDERICK JAMES, Pisgah Forest, N. C. 1937
RUGG, HAROLD GODDARD, Dartmouth College, Hanover, N. H. 1919
RUSSELL, HENRY NORRIS, JR., 79 Alexander St., Princeton, N. J. 1931
RUSSELL, DR. WHITFIELD LIGGETT, Box 22, Rhome, Texas 1934
RUST, HENRY JUDSON, Coeur d'Alene, Idaho 1918
RUSTAD, ORWIN ALEXANDER, 618 E. Division St., Faribault, Minn. 1937
RUTLEDGE, HUGH MIDDLETON, 19 Queen St., Charleston, S. C. 1936
RUTTER, RUSSELL JAMES, c/o Brodie Club, 100 Queen's Park, Toronto, Ont., Can. 1928
SAGE, MRS. MARY SEARL, Nat. Assn. Audubon Societies, 1775 Broadway, New York, N. Y. 1919
SALLEE, ROY MERRIDITH, 131 No. Normal St., Macomb, Ill. 1931
SALOMONSEN, FINN, Slotsholmsgade 16, Copenhagen, Denmark 1927
SALYER, J[OHN] CLARK, Biol. Surv., Dept. Agr., Washington, D. C. ..... (1919–25) 1931
SAMPSON, PROF. EDWARD, East Guyot Hall, Princeton, N. J. 1936
SAMPSON, WALTER BEHRNARD, 1005 N. San Joaquin St., Stockton, Calif. 1922
SAMPSON, WILLIAM FRANCIS, Pier 1, c/o Bay Transport Co., San Francisco, Cal. 1929
*SANFORD, DR. LEONARD CUTLER, 245 Whitney Ave., New Haven, Conn. 1919
SANTENS, REMI HENRI, Carnegie Museum, Pittsburgh, Pa. 1918
SARGENT, WILLIAM DUNLAP, Biol. Dept., College of City New York, 23d St. and Lexington Ave., New York, N. Y. 1930
SASS, HERBERT RAVENEL, 23 Legare St., Charleston, S. C. 1923
SATTERTHWAIT, MRS. ALFRED FELLENBERG, 806 W. Ohio St., Urbana, Ill. 1920
SAUNDERS, PROF. FREDERICK ALBERT, 8 Berkeley Place, Cambridge 38, Mass. 1923
SAUNDERS, GEORGE BRADFORD, Biol. Surv., 562 Custom House, Denver, Colo. 1925

SAUNDERS, RICHARD MERRILL, 17 Elgin Ave., Toronto, Ont., Can. 1935
SAVAGE, RALPH BUTLER, JR., 934 Bellefonce St., Pittsburgh, Pa. 1936
SAVIN, WILLIAM MORGAN, Annandale, Hunterdon Co., N. J. 1921
SAWYER, MISS DOROTHY MAY, Box 433, Sidney, N. Y. 1936
SAWYER, EDMUND JOSEPH, Fernow Hall, Cornell Univ., Ithaca, N. Y.
(1915–18; 1922–30) 1936
SAXTON, REXFORD NICHOLS, 1509 20th St., N. W., Washington, D. C. 1933
SCHAEFER, HENRY ROBERT, Sargent Road, R. F. D. 2, Hyattsville, Md. 1933
SCHAEFER, OSCAR FREDERICK, 724 Woodbine St., Rochester, N. Y. 1916
SCHEAR, PROF. EDWARD WALDO EMERSON, 107 W. Park St., Westerville, Ohio . . 1922
SCHELL, CHARLES MARTIN, 86 Meadow Lane, New Rochelle, N. Y. 1936
SCHEUCK, MISS KATHRYN ALDEN, 4451 Main St., Snyder, N. Y. 1935
SCHIERBAUM, MISS ETHEL, 5521 Blackstone Ave., Chicago, Ill. 1937
SCHINDEL, ROBERT RANDOLPH, 145 Walnut St., Sunbury, Pa. 1932
SCHMID, EDWARD SIDNEY, 712 12th St., N. W., Washington, D. C. 1931
SCHMIDT, EUGENE WILLIAM, 494 Church St., New Britain, Conn. 1927
SCHMIDT, RICHARD HEINRICH, Canton, Kans. 1937
SCHOEDINGER, GEORGE RICHARD, JR., 78 Auburn Ave., Columbus, Ohio 1926
SCHORGER, ARLIE WILLIAM, 168 N. Prospect Ave., Madison, Wis. 1913
SCHRENCK, DR. HERMANN VON, Tower Grove and Flad Aves., St. Louis, Mo. . . 1919
SCHULTZ, MISS HELEN HOUSER, Box 105, S. T. C., Fredericksburg, Va. 1933
SCHWANDT, MISS IRMA M., 1157 Kavanaugh Place, Wauwatosa, Wis. 1934
SCHWARZ, HERBERT FERLANDO, Am. Mus. Nat. Hist., New York, N. Y. 1925
SCHWEITZER, THEO. G., 317 N. 4th St., Hannibal, Mo. 1936
SCOTLAND, DR. MINNIE B., 42 Continental Ave., Cohoes, N. Y. 1936
SCOTT, F[REDERICK] CLEMENT, 12 Highland Ave., Darien, Conn. 1931
SCOTT, DR. JOHN WILLIAM, 400 W. 27th St., Cheyenne, Wyo. 1934
SCOTT, OLIVER KENNARD, Central St., Framingham, Mass. 1936
SCOTT, WALTER EDWIN, Conservation Dept., State Capitol, Madison, Wis. 1937
SCOVILLE, SAMUEL, JR., 1307 Penn Bldg., Philadelphia, Pa. 1916
SEAMAN, GEORGE ALBERT, c/o Standard Oil of Venezuela, Caripito, Venezuela . 1937
SEARS, J[OSEPH] ALDEN, 742 Cummings Ave., Kenilworth, Ill. 1934
SEDGWICK, JAMES HOWARD, 4800 Prospect Road, Peoria, Ill. 1936
SEFTON, JOSEPH WELLER, JR., 638 F St., San Diego, Calif. 1922
SEIBERT, HENRI CLERET, 414 Northway, Baltimore, Md. 1934
SEIPLE, STANLEY JULIUS, 600 Spring St., Grove City, Pa. 1927
SELTER, MISS VIVIAN, 719 Times Bldg., St. Petersburg, Fla 1937
*SEMPLE, JOHN BONNER, Sewickley, Pa. 1924
*SERPELL, GOLDSBOROUGH, Seaboard Nat. Bank, Norfolk, Va. 1926
SERRILL, WILLIAM JONES, Haverford, Pa. 1916
SHADLE, DR. ALBERT RAY, Biol. Dept., Univ. Buffalo, Buffalo, N. Y. 1928
SHAFTESBURY, ARCHIE D., Woman's College, University of North Carolina,
Greensboro, N. C. 1937
SHARP, BARTON LAMAR, 201 N. Broad St., Lititz, Pa. 1931
SHARP, DR. WARD M., Valentine Lakes Waterfowl Refuge, Valentine, Nebr. . . 1936
*SHAW, HENRY SOUTHWORTH, 136 High St., Exeter, N. H. 1916
SHAW, TSEN HWANG, Fan Memorial Inst. of Biology, Peiping, China 1922
SHAW, DR. WILLIAM THOMAS, 1002 Cambridge Ave., Fresno, Calif. 1908
SHEARER, DR. AMON ROBERT, Mont Belvieu, Chambers Co., Texas . . (1893–97) 1905
SHEFFLER, WILLIAM JAMES, 4731 Angeles Vista Blvd., Los Angeles, Calif. 1928

SHELDON, MISS CAROLYN, Woodstock, Vt. 1930
SHELDON, HENRY ERNEST, 21 Norwood Ave., Norwalk, Ohio 1926
SHELFORD, DR. VICTOR ERNEST, Expt. Zoöl. Lab., Champaign, Ill. 1931
SHELLEY, LEWIS ORMAN, P. O. Box 22, East Westmoreland, N. H. 1925
SHELTON, A[LFRED] C[OOPER], 107 Upland Ave., Newton Highlands, Mass. 1935
SHEPHERD, EMMETT HILL, 208 So. McDonough St., Montgomery, Ala 1937
SHEPPARD, ROY WATSON, 1805 Mouland Ave., Niagara Falls, Ont., Can. 1928
SHERWOOD, JOHN WILLITS, Route 1, Box 1070, Salinas, Calif. 1929
SHERWOOD, ROBERT COVELL, 38 Vassar St., Springfield, Mass. 1921
SHIPLEY, MISS SYLVIA ANN, The Shipley School, Bryn Mawr, Pa. 1935
SHOEMAKER, HENRY WHARTON, Room 409, 71 Broadway, New York, N. Y. 1912
SHOFFNER, CHARLES PENNYPACKER, Room 25, 725 Walnut St., Philadelphia, Pa. 1915
SHORTT, ANGUS HENRY, Manitoba Museum, Auditorium Bldg., Winnipeg, Man., Can. 1935
SHORTT, TERENCE MICHAEL, Royal Ont. Mus., Toronto 5, Ont., Can. 1931
SHREVE, BENJAMIN, 29 Chestnut St., Salem, Mass. 1933
SHULL, MISS ELIZABETH B., 167 Johnson Hall, 411 W. 116th St., New York, N. Y. 1933
SILLIMAN, OSCAR PERRY, c/o Mitchell-Silliman Co., Salinas, Calif. 1915
SIMONS, EDWARD ALEXANDER, 4 Lamboll St., Charleston, S. C. 1928
SIMPSON, THOMAS, 81 Stonewall Place, Memphis, Tenn. 1936
SIMS, HAROLD LEE, Thibodaux, La. 1937
SKILLEN, DR. DONALD RALPH, 317 S. 46th St., Philadelphia, Pa. 1929
SKINNER, MILTON PHILO, 1316 Harding St., Long Beach, Calif. 1916
SKUTCH, ALEXANDER FRANK, 3509 Clark's Lane, Baltimore, Md. 1930
SLACK, MISS MABEL, 1004 Everett Ave., Louisville, Ky. 1937
SLADEN, MAJOR ALEXANDER GEORGE LAMBERT, Kingswood House, The Lee, Gt. Missenden, Bucks, England 1927
SLAWSON, DR. EDWARD DOUGLASS, 708 N. Sheridan St., Bay City, Mich. 1921
SLOCUM, HARRY SPENCER, 4 Whitehorn Lane, Bluefield, W. Va. 1928
SMACH, HENRY HARRY, 1300 S. Euclid Ave., Berwyn, Ill. 1934
SMALL, COL. WILLIAM MELVILLE, 601 Upland Drive, San Francisco, Calif. 1924
SMILEY, ALBERT KEITH, JR., Mohonk Lake, Ulster Co., N. Y. 1928
SMILEY, DANIEL, JR., Mohonk Lake, Ulster Co., N. Y. 1928
SMITH, MISS ALTA, 2057 7th St., Cuyahoga Falls, Ohio 1934
SMITH, AUSTIN PAUL, Zarcero, Costa Rica 1911
SMITH, CHARLES PIPER, Rt. 1, Box 24, Saratoga, Calif. 1929
SMITH, CLARENCE F., Biol. Survey, U. S. Dept. Agr., Washington, D. C. 1936
SMITH, EARL R., P. O. Box 641, New Orleans, La. 1924
SMITH, MRS. ELIZABETH BURNELL, 1037 N. Stanley Ave., Los Angeles, Calif. .. 1923
SMITH, MISS EMILY, Route 1, Box 93, Los Gatos, Calif. 1929
SMITH, PROF. FRANK, 79 Fayette St., Hillsdale, Mich. 1909
SMITH, FOSTER DEWEY, JR., 161 South St., Morristown, N. J. 1937
SMITH, FRANK RUSH, R. D. 2, Box 100, Laurel, Md. 1926
SMITH, GEORGE SCOTT, c/o Fritz Karry, R. D. 1, Pickering, Ont., Can. 1935
SMITH, MRS. HERBERT WATSON, 86 S. Bay Ave., Islip, Suffolk Co., N. Y. 1925
SMITH, MRS. HERMON DUNLOP, 370 Onwentsia Rd., Lake Forest, Ill. 1936
**SMITH, HORACE GARDNER, 2918 Lafayette St., Denver, Colo. 1888
**SMITH, DR. HUGH MCCORMICK, 1209 M St., N. W., Washington, D. C. 1886

SMITH, LESTER WHEADON, 60 Cottage St., Meriden, Conn. 1916
SMITH, LEWIS MACCUEN, 26 Benezet St., Chestnut Hill, Philadelphia, Pa. 1927
SMITH, LORIS PHILBRICK, 2017 108th Ave., Oakland, Calif. 1931
SMITH, NAPIER, c/o Credite Balear, Palma de Mallorca, Balearic Ids., Spain 1915
SMITH, REV. O[NNIE] WARREN, 50 South Church St., Oconomowoc, Wis. 1924
SMITH, RONALD WARD, P. O. Box 362, Wolfville, Nova Scotia, Can. 1932
SMITH, ROWLAND ARTHUR, 211 Dunn Ave., Toronto, Ont., Can. 1934
SMITH, ROY HARMON, 183 N. Prospect St., Kent, Ohio 1922
SMITH, MRS. WALLIS CRAIG, 525 N. Mich. Ave., Saginaw, W. S., Mich. 1916
SMITH, WILLIAM A., Maple Ave., Lyndonville, N. Y. 1936
SMOOKER, GEORGE DOUGLAS, Mt. Hope, St. Joseph, Trinidad, B. W. I. 1926
**SMYTH, ELLISON ADGER, JR., Rt. 2, Box 166, Salem, Va. 1892
SMYTH, J[AMES] ADGER, Salem, Va. 1933
SMYTH, DR. THOMAS, State Teachers College, Indiana, Pa. 1921
SNOW, MISS GRACE MARION, 39 Forest St., Winchester, Mass. 1922
SNOW, MRS. CHESTER, 6805 Brookville Road, Chevy Chase, Md. 1935
SNYDER, L. H., Chosen Christian College, Seoul, Korea 1936
**SNYDER, WILL EDWIN, 309 DeClarke St., Beaver Dam, Wis. 1895
SOMMER, JOSEPH B., 907 Knoxville St., Peoria, Ill. 1934
SOUTHAM, HERBERT HUGH, 62 Laing St., Toronto, Ont., Can. 1936
SPAULDING, MISS NINA GERTRUDE, Jaffrey, N. H. 1922
SPEIRS, JOHN MURRAY, 17 Wolfrey Ave., Toronto 6, Ont., Can. 1935
SPELMAN, HENRY MUNSON, 48 Brewster St., Cambridge, Mass. ..... (1883–99) 1911
SPERRY, CHARLES CARLISLE, 1455 S. Franklin St., Denver, Colo. 1920
SPIKER, CHARLES JOLLEY, Branchport, N. Y. 1933
*SPINGARN, EDWARD DAVID WOODBERRY, Amenia, N. Y. 1924
SPOFFORD, WALTER RICHARDSON, 2D, A 124, Dept. Anatomy, 1300 N. Y. Ave., New York, N. Y. 1927
SPRIDGEN, MAY CAROLINE, Yorkville, Ill. 1937
SPRINGER, MRS. IONE S., 87 Biltmore St., Springfield, Mass. 1937
SPROT, GEORGE DOVETON, R. M. D., Cobble Hill, Vancouver Island, B. C., Can. 1923
STABLER, HAROLD BROOKE, 6123 Broad Branch Road, Washington, D. C. 1937
STACKPOLE, RICHARD, 292 Beacon St., Boston, Mass. 1937
STAEBLER, ARTHUR EUGENE, Route 5, Box 252, Ann Arbor, Mich. 1935
STANDLEY, THEODORE ROOSEVELT, R. D. 1, Fort Myers, Fla. 1937
STANFORD, DR. JOSEPH SEDLEY, 445 N. 7th St. E., Logan, Utah 1929
STANLEY, DR. ARTHUR CAMP, The Farragut, Washington, D. C. 1925
STANNARD, CARLOS, R. D. 1, Box 1178, Phoenix, Arizona 1937
STARRETT, WILLIAM CHARLES, 303 Maryland Ave., Peoria, Ill. 1932
STEBBINS, MISS FANNIE ADELL, 31 Ely Ave., West Springfield, Mass. 1922
STEELE, RAY CALDWELL, Federal Bldg., Winona, Minn. 1935
STEENIS, JOHN HOLT, Des Lacs Waterfowl Refuge, Kenmare, N. Dak. 1937
STEVENSON, H[ENRY] BERNARD, Blue Ridge School for Boys, Hendersonville, N. C. 1930
STEVENSON, JAMES OSBORNE, Wildlife Div., Nat. Park Service, Washington, D. C. 1926
STEWART, PAUL ALVA, R. D. 1, Leetonia, Ohio 1928
STILLWELL, JERRY E., 7460 San Benito Way, Dallas, Texas 1934
STINE, MISS PERNA M., State Teachers College, Minot, N. Dak. 1936
STOCKMANN, STEN, Skeppanegatan 6, Helsingfors, Finland 1930

STONE, HARRY HERBERT, JR., Sturbridge, Mass. 1919
*STONE, MRS. WITMER, 452 Church Lane, Germantown, Philadelphia, Pa. 1920
STONER, EMERSON AUSTIN, Box 444, Benicia, Calif. 1922
STOPHTET, JOHN JERMAIN, 2612 Maplewood Ave., Toledo, Ohio 1937
STORER, JOHN HUMPHREYS, Ferncroft, Beaver St., Waltham, Mass. 1937
STORER, ROBERT WINTHROP, 322 Vose Ave., South Orange, N. J. 1935
STORROW, MRS. EDWARD CABOT, Common St., Dedham, Mass. 1937
STOUT, CLIFFORD RAY, 431 N. Hough St., Barrington, Ill. 1931
STREIT, RAYMOND E., 50 Broadway, New York, N. Y. ..... (1921–24) 1929
STROLEY, MISS ELSIE ANNETTE, Morristown, N. J. 1937
STUPKA, ARTHUR, Great Smoky Mts. Nat. Park, Gatlinburg, Tenn. 1934
STUPP, JACK PHELPS, 510 S. Price Road, St. Louis, Mo. 1934
STURGIS, IRVIN ST. JEAN, R. F. D., c/o Ethel Lyons Van Meter, Higginsville, Mo. 1934
STURGIS, MRS. SAMUEL DAVIS, 21 W. 58th St., New York, N. Y. 1925
**STURTEVANT, EDWARD, St. George's School, Newport, R. I. 1896
SUGDEN, DR. JOHN W., 1743 Yale Ave., Salt Lake City, Utah 1927
SUMNER, EUSTACE LOWELL, JR., National Park Service, 611 Sheldon Bldg., San Francisco, Calif. 1926
SUTHARD, JAMES GREGORY, 832 Ohio Ave., Long Beach, Calif. 1923
SUTHERLAND, EARL LLOYD, Keuka Park, N. Y. 1935
SWAIN, JOHN MERTON, 15 Pleasant St., Farmington, Maine 1899
SWANSON, GUSTAV ADOLPH, Univ. Minn. Farm, St. Paul, Minn. 1928
SWEDENBORG, ERNIE DAVID, 4905 S. Vincent Ave., Minneapolis, Minn. 1927
SWEET, HERMAN ROYDEN, Dept. Biol., Tufts College, Medford, Mass. 1933
SWIFT, HEWSON A., 99 Claremont Ave., New York, N. Y. 1937
SWOPE, DR. EUGENE, Roosevelt Bird Sanctuary, Oyster Bay, N. Y. 1921
TABER, WENDELL, 3 Mercer Circle, Cambridge, Mass. 1933
TABOR, MISS AVA ROGERS, 305 Canal Ave., Thibodaux, La. 1937
TALBOT, LESTER RAYMOND, 12 Forest Rd., Greenwood, Mass. 1920
TANNER, JAMES TAYLOR, 67 Greenbush St., Cortland, N. Y. 1933
TANNER, OREY, 5019 Constance St., New Orleans, La. 1932
TATNALL, SAMUEL ALSOP, 503 Hansberry St., Philadelphia, Pa. 1916
TAVISTOCK, MARQUIS OF, Warblington House, Havant, Hants, Eng. 1928
TAYLOR, ALEXANDER R., Cayce, S. C. 1907
TAYLOR, HORACE, 294 Walnut St., Brookline, Mass. 1917
TAYLOR, DR. LEWIS WALTER, Poultry Div., Univ. Calif., Berkeley, Calif. 1925
TAYLOR, LIONEL EDWARD, R. R. 1, Saanichton, B. C., Can. 1913
TAYLOR, MRS. LOUIS ROBERTS, 926 East Kilbourn Ave., Milwaukee, Wis. 1935
TAYLOR, OTIS BOYD, 2606 The Plaza, Richmond, Va. 1934
TAYLOR, MRS. SUSAN E., Box 335, Morganton, N. C. 1937
TAYLOR, DR. WALTER PENN, Faculty Exchange, College Station, Tex. (1911–12) 1916
TEACHENOR, DIX, 1020 W. 61st St., Kansas City, Mo. 1919
TEE-VAN, JOHN, 120 East 75th St., New York, N. Y. 1921
TENNANT, ARTHUR, 415 No. Sheridan St., Bay City, Mich. 1937
TERRES, JOHN KENNETH, Soil Conservation Service, Bath, N. Y. 1934
TERRILL, LEWIS MCIVER, 216 Redfern Ave., Westmount, Que., Can. 1907
TERRY, DR. ROBERT JAMES, 5149 Westminster Place, St. Louis, Mo. 1919
TEST, PROF. LOUIS AGASSIZ, 511 Russell St., West Lafayette, Ind. 1929
THABES, MRS. JOHN ALOIS, SR., 417 Holly St., Brainerd, Minn. 1920
THACHER, LOUIS BARTLETT, JR., 192 Hinckley Road, Milton, Mass. 1931

THACKER, THOMAS LINDSAY, Little Mountain, Hope, B. C., Can. 1928
THOMAS, ALLEN MARVIN, Graham School, Hastings on Hudson, N. Y. 1934
THOMAS, EDWARD SINCLAIR, 1116 Madison Ave., Columbus, Ohio 1922
THOMAS, MRS. ROWLAND, Route 4, North Little Rock, Ark. 1935
THOMPSON, JOHN WALCOTT, 527 East First South St., Salt Lake City, Utah 1916
THORP, GEORGE BOULTON, Carnegie Inst. Technology, Pittsburgh, Pa. 1935
*THORNE, MRS. WILLIAM VAN SCHOONHOVEN, 19 E. 72nd St., New York, N. Y. 1925
THOWLESS, HERBERT LANDO, 255 4th St., Newark, N. J. 1919
TIEMEIER, OTTO WILLIAM, Museum of Birds, Univ. Kansas, Lawrence, Kans. 1937
TINKER, ALMERIN DAVID, 519 Oswego St., Ann Arbor, Mich. 1907
TOMKINS, IVAN REXFORD, U. S. Engineer Dept., Savannah, Ga. 1928
TOMLINSON, IRVING CLINTON, 137 Marlborough St., Boston, Mass. 1920
TONER, GEORGE CLIVE, Box 88, Gananoque, Ont., Can. 1935
TONKIN, GEORGE, 207 Federal Office Bldg., Des Moines, Iowa 1932
*TORREY, DR. HENRY NORTON, 575 Lake Shore Road, Grosse Pointe, Detroit, Mich. 1927
TOUSEY, MISS KATHARINE, 22 Grand View Ave., Somerville, Mass. 1935
TOUT, WILSON, North Platte, Nebr. 1935
TOWNSHEND, HENRY HOTCHKISS, 35 Hillhouse Ave., New Haven, Conn. 1915
TRACY, ERNEST B., Holland Road, Far Hills, N. J. 1936
TRAEGER, JOHN HECKEWELDER, 79 W. Market St., Bethlehem, Pa. 1926
TRAINER, JOHN EZRA, Morningside Terrace, Allentown, Pa. 1937
TRASK, DR. PARKER DAVIES, Geological Survey, Washington, D. C. 1936
TRAUTMAN, MILTON BERNHARD, Mus. Zoöl., Univ. Mich., Ann Arbor, Mich. 1924
TREADWAY, JOHN FOWLER, Williams Inn, Williamstown, Mass. 1931
TRIMBLE, MISS RUTH, 309 Eicher Ave., Greensburg, Pa. 1932
TRINE, MRS. GEORGE WASHINGTON, Red Cloud, Nebr. 1935
TROUSLOT, ROLLIN BURDETTE, P. O. Box 373, Walnut Creek, Calif. 1933
TRUESDELL, JOHN FESSENDEN, 6310 Franklin Circle, Hollywood, Calif. 1918
TRUITT, CLARENCE FRANK, 327 N. First St., Yakima, Wash. 1935
TUCKER, BERNARD WILLIAM, 9 Marston Ferry Road, Oxford, England 1935
TUCKER, CARLL, Mt. Kisco, N. Y. 1929
*TUCKER, MRS. CARLL, 733 Park Ave., New York, N. Y. 1924
TUFTS, ROBIE WILFRID, Wolfville, Nova Scotia, Can. 1919
TURNBOW, MRS. VIOLA CLOUD, 4701 Pitt St., New Orleans, La. 1937
TURNBULL, JAMES DOUGLAS, 2065 West 48th Ave., Vancouver, B. C. 1927
TURTLE, LANCELOT JAMES, 17–21 Castle Place, Belfast, Ireland 1928
TUTTLE, HENRY EMERSON, 271 Park St., New Haven, Conn. 1909
TWOMEY, ARTHUR CORNELIUS, Camrose, Alberta, Can. 1930
TYLER, BRUCE PHILIPS, 215 W. Unaka Ave., Johnson City, Tenn. 1934
TYLER, JOHN GRIPPER, 1115 Thorne St., Fresno, Calif. 1912
TYRRELL, WILLIAM BRYANT, 404 Frederick Rd., Catonsville, Md. 1922
ULRICH, MRS. ALICE SHERMAN, 193 La Salle Ave., Buffalo, N. Y. 1935
ULRICH, EDWARD CARL, 275 Mulberry St., Buffalo, N. Y. 1935
*UNDERDOWN, HENRY TENER, 8216 Manor Rd., Elkins Park, Pa. 1921
UNGLISH, WILLIAM ELMER, 345 N. Rosanna St., Gilroy, Calif. 1924
USSHER, RICHARD DAVY, Nancy Lake Farm, R. R. 2, King, Ont., Can. 1931
VAIDEN, M. GORDON, Box 248, Rosedale, Miss. 1936
VALENCOURT, CHARLES WILLIAM, Carleton College, Northfield, Minn. 1936

VALENTINE, MISS MARGUERITE ELSIE, 66 Robinson Ave., Glen Cove, L. I., N. Y. 1933
VANDERVORT, CHARLES CHAMPION, Laceyville, Pa. 1937
VAN DEUSEN, HOBART MERRITT, 128 Pinehurst Ave., New York, N. Y. 1937
VAN DEVENTER, DR. WILLIAM CARL, St. Viator College, 211 Main St., Bourbonnais, Ill. 1936
VAN DUYN, GUY, 315 Howell Ave., Brooksville, Fla. 1937
VAN DYKE, REV. TERTIUS, Washington, Conn. 1930
VAN HYNING, DR. THOMPSON, State Museum, Univ. Florida, Gainesville, Fla. 1926
VAN MARLE, JOHANN GOTTLIEB, Beethovenstraat 65, Amsterdam, Holland 1928
VAN NAME, WILLARD GIBBS, Am. Mus. Nat. Hist., New York, N. Y. 1900
VAN SCHAICK, DR. JOHN, JR., 176 Newbury St., Boston, Mass. 1926
VAN TIENHOVEN, DR. PIETER GERBRAND, c/o Nederlandsche Vereeniging tot Bescherming van Vogels, Heerengracht 540, Amsterdam, Holland 1928
VARLEY, JAMES ARTHUR, 99 Glencairn Ave., Toronto, Ont., Can. 1926
VASICEK, JOHN MATTHEW, 10605 Lamontier Ave., Cleveland, Ohio 1932
VAUGHAN, MRS. HENRY G., So. Berwick, Maine 1937
VAUGHAN, WILLIAM C., 591 Ashland Ave., Buffalo, N. Y. 1935
VERGES, EUGENE MARCELIN, 2D, 1126 Beacon St., Brookline, Mass. 1931
VERNON, DR. JAMES W., Broadoaks Sanatorium, Morganton, N. C. 1937
VERWEY, JAN, Zoöl. Station, Den Helder, Holland 1928
VETTER, DR. CHARLES, Grand View, Nyack, N. Y. 1898
VILLALBA, GASTON SANCHEZ, Calle B No. 10, Vedado, Habana, Cuba 1934
VOGEL, HOWARD HOLLISTER, JR., 8 Andover Hall, Cambridge, Mass. 1935
VORHIES, DR. CHARLES TAYLOR, Univ. Ariz., Tucson, Ariz. 1918
WADE, JOSEPH SANFORD, Bur. Entomology, Dept. Agric., Washington, D. C. 1929
*WALCOTT, HON. FREDERIC COLLIN, Norfolk, Conn. (1913–15) 1921
WALCOTT, JUDGE ROBERT, 152 Brattle St., Cambridge, Mass. 1924
WALKER, CHARLES FREDERIC, 53 Latta Ave., Columbus, Ohio 1927
WALKER, ERNEST PILLSBURY, Apt. 103, 3016 Tilden St., N. W., Washington, D. C. 1918
WALKER, ROLAND, Biol. Lab., Rennselaer Poly. Inst., Troy, N. Y. 1924
WALKINSHAW, DR. LAWRENCE HARVEY, 1421 W. Michigan Ave., Battle Creek, Mich. 1929
WALLACE, DR. GEORGE JOHN, Pleasant Valley Bird Sanctuary, Lenox, Mass. 1935
WALLACE, ROBERT BROWNE, 3213 Oakland St., Ames, Iowa 1935
WALLIS, JOSIAH KENDALL, 132 Holder Hall, Princeton, N. J. 1926
WALSH, LESTER LEWIS, 294 Bronxville Rd., Bronxville, N. Y. 1925
WALTER, MISS BERNICE VIOLET, 311 Bedford Park Blvd., New York, N. Y. 1936
WALTER, DR. HERBERT EUGENE, 67 Oriole Ave., Providence, R. I. 1901
WALTERS, FRANK, 536 Grand Central Palace, New York, N. Y. 1902
WANAMAKER, PAUL, 443 Seminole St., Oradell, N. J. 1930
WANLESS, JOHN, 243 Yonge St., Room 5, Toronto, Ont., Can. 1928
WARBURTON, STANTON, JR., 3516 N. 33d St., Tacoma, Wash. 1928
WARD, FRANK HOWLEY, 18 Grove Place, Rochester, N. Y. 1908
WARD, HENRY LEVI, 6316 W. Washington Blvd., Wauwatosa, Wis. 1906
WARFIELD, BENJAMIN BRECKINRIDGE, 402 E. 48th St., New York, N. Y. 1930
WARMBATH, JULIAN SAMUEL, U. S. National Museum, Washington, D. C. 1933
WASHBURN, MISS MARIAN, 165 E. Columbia St., Marion, Ohio 1936
WATKINS, ALLAN GODFREY, U. S. Forest Service, Saucier, Miss. 1929
WATSON, CHARLES GRAY, 201 Ridout St., S., London, Ont., Can. 1919
WATSON, FRANK GRAHAM, 101 Lockhart Hall, Princeton, N. J. 1936

WATTERS, ROBINSON C., P. O. Box 298, Cambridge, Maryland.....1937
WEAVER, CLIFTON STOKES, Va. Military Inst., Lexington, Va.....1934
WEAVER, RICHARD, Fernow Hall, Cornell Univ., Ithaca, N. Y.....1936
WEBER, ALOIS JOHN, 904 Grand Ave., Keokuk, Iowa.....1928
WEBER, JAY ANTHONY, 151 Grand Ave., Leonia, N. J.....1907
WEBER, ORLANDO FRANKLIN, JR., 22 East 82d St., New York, N. Y.....1935
WEBER, WALTER ALOIS, 1025 Wade St., Highland Park, Ill.....1928
WEBSTER, RANDALL, 341 Western Ave., Brookville, Pa.....1937
WEED, CLARENCE MOORES, 854 Andover St., Lowell, Mass.....1924
WEIG, MELVIN JOHN, 108 Washington Ave., Morristown, N. J.....1937
WEISER, CHARLES SPANGLER, 1901 E. Market St., York, Pa.....1916
WELCH, CECIL MELVIN, Polytechnic Institute, Polytechnic, Mont.....1935
WELLER, MRS. SELDEN, Oyster Bay Rd., Locust Valley, Long Island, N. Y.....1934
*WELLING, YENS M., 1828 East 5th St., R. F. D. 1, Anderson, Ind.....1924
*WELLMAN, REV. GORDON BOIT, 17 Midland Rd., Wellesley, Mass.....1908
WELSH, WILLIAM WILSON, 135 So. La Salle St., Chicago, Ill.....1937
WELTER, WILFRED AUGUST, Dept. Sci., State Teachers College, Morehead, Ky. 1930
WENDLE, MRS. JOSEPH, Bowron Lake, Barkerville, B. C., Can.....1927
WEST, CHARLES COBIA, McClellanville, S. C.....1937
WESTLAKE, EDWARD F., JR., 610 Allison Ave., Washington, Pa.....1937
WETHERBEE, MRS. KENNETH BRACKETT, 11 Dallas St., Worcester, Mass.....1929
WEYDEMEYER, WINTON, Fortine, Mont.....1925
WEYGANDT, DR. CORNELIUS, 6635 Wissahickon Ave., Philadelphia, Pa.....1907
WEYL, EDWARD STERN, 6506 Lincoln Drive, Mt. Airy, Philadelphia, Pa.....1921
*WHARTON, WILLIAM PICKMAN, Groton, Mass.....1907
WHEATLEY, MAX DELBY, Mus. of Birds & Mammals, Univ. Kansas, Lawrence, Kans.....1937
WHITAKER, JAMES DAVIES, 411 Linden St., Wellesley Hills, Mass.....1924
WHITE, ALFRED FISHER, 1944 41st Ave., Oakland, Calif.....1926
WHITE, EDWARD FRANCIS GEOFFREY, 185 Wurtemburg St., Ottawa, Can.....1927
*WHITE, GEORGE WHITNEY, Nat. Metropolitan Bank, Washington, D. C.....1924
WHITE, JAMES SAMUEL, 2207 Lincolnwood Rd., Highland Park, Ill.....1928
WHITMAN, FRANK BURTON, JR., 103 Tyler St., Wollaston, Mass.....1930
WHITNEY, ALVIN GOODNOW, State Mus., Albany, N. Y.....1925
WHITNEY, HOWARD, North Main Street, Southington, Conn.....1921
WHITTAKER, CARTER READE, 279 Tenth St., N. E., Atlanta, Ga.....1928
WHITTLE, CHARLES LIVY, River Crossroads, Peterborough, N. H.....1916
*WHITTLE, MRS. HELEN GRANGER, River Crossroads, Peterborough, N. H.....1904
WICKS, MRS. JUDSON LANE, 2615 Park Ave., Minneapolis, Minn.....1922
WIDMANN, BERTHOLD, 4621 Wesley Ave., Los Angeles, Calif.....1936
WIEGMANN, DR. WILLIAM HENRY, 436 E. 5th St., New York, N. Y.....1916
*WIGGLESWORTH, DR. EDWARD, Boston Soc. Nat. Hist., Boston, Mass.....1920
WIGHT, HOWARD MARSHALL, 1417 S. University Ave., Ann Arbor, Mich.....1934
**WILBUR, ADDISON PRENTISS, 60 Gibson St., Canandaigua, N. Y.....1895
WILCOX, LEROY, Speonk, L. I., N. Y.....1927
**WILCOX, THOMAS FERDINAND, Smith Ridge, New Canaan, Conn.....1895
WILDER, REV. GEORGE DURAND, 909 Woods Rd., Ypsilanti, Mich.....1929
WILEY, MISS FARIDA ANNA, Prospect Ave. & Willow St., Douglaston, L. I., N. Y.1925
WILK, ALBERT, R. D. No. 2, Camrose, Alberta, Can.....1936
WILKINSON, ALEXANDER STANLEY, Kapiti Island Bird Sanctuary, Paraparamon P. O., North Island, via Wellington, N. Z.....1929

WILLARD, BERTEL GLIDDEN, 51 Fresh Pond Parkway, Cambridge, Mass. 1906
WILLARD, OSCAR THEODORE, 5343 Blackstone Ave., Chicago, Ill. 1919
WILLIAMS, CECIL SLOAN, P. O. Box 603, Brigham City, Utah 1937
WILLIAMS, ELLISON ADGER, 27 Limehouse St., Charleston, S. C. 1923
WILLIAMS, JOHN RAYNESFORD, 801 W. Nevada St., Urbana, Ill. 1936
WILLIAMS, LAIDLAW ONDERDONK, P. O. Box 453, Carmel, Calif. 1919
**WILLIAMS, ROBERT STATHAM, Botanical Gardens, Bronx, New York, N. Y. . 1888
WILLIAMS, ROLAND, 163 Bertling Lane, Winnetka, Ill. 1925
WILSON, ARCHIE FRANCIS, 1921 Lake Ave., Whiting, Ind. 1937
WILSON, DR. FRANK NORMAN, 804 Lawrence St., Ann Arbor, Mich. 1922
WILSON, GORDON, 1434 Chestnut St., Bowling Green, Ky. 1919
WILSON, KENNETH ALDEN, Box 280, Salisbury, Md. 1937
WIMSATT, WILLIAM ABELL, 11 Grafton St., Chevy Chase, Md. 1937
WINEMAN, ANDREW, 150 Michigan Ave., Detroit, Mich. 1932
WING, GEORGE STUART, Rt. 3, Jackson, Mich. 1924
WING, LEONARD WILLIAM, Box 364, Norris, Tenn. 1929
WOLFARTH, FLOYD, 280 Carlton Ave., East Rutherford, N. J. 1937
WOLFE, CAPT. LLOYD RAYMOND, 2620 Grays Ferry Rd., Philadelphia, Pa. 1922
WOOD, DR. HAROLD BACON, 3016 North 2d St., Harrisburg, Pa. 1929
WOOD, MERRILL, Zool. Dept., Penn. State College, State College, Pa. 1927
WOODHULL, DR. MAURICE WELSH, Cottonwood Falls, Chase Co., Kans. 1928
WOODLETON, MRS. HELEN SAUNDERS, 454 Seventh St., Brooklyn, N. Y. 1933
WOODRING, GEORGE B., Am. Nat. Bank, Hillsboro Br., Nashville, Tenn. 1935
WOODS, HARRY EARLE, P. O. Box 216, Huntington, Mass. 1924
*WOODS, ROBERT S., Box 356, Azusa, Los Angeles Co., Calif. 1926
WOODWARD, ARTHUR JASON, 504 Kahkwa Blvd., Erie, Pa. 1935
WOOLMAN, MISS ANNA, 21 N. Highland Ave., Lansdowne, Pa. 1920
WOOLMAN, EDWARD, Panmure Rd., Haverford, Pa. 1925
WOOLSTON, WILLIAM JENKS, R. D. 2, Miquon Rd., Conshohocken, Pa. 1925
WORK, MRS. ROBERT, Bosky Acres, Barrington, Ill. 1934
WORKMAN, WILLIAM HUGHES, Lismore, Windsor Ave., Belfast, Ireland. 1928
WORTH, DR. C[HARLES] BROOKE, 602 W. Elm Ave., Swarthmore, Pa. 1927
WRIGHT, FRANK SMITH, 14 Cayuga St., Auburn, N. Y. 1917
WRIGHT, WILLIAM BURRITT, 22 7th Ave., Haddon Heights, N. J. 1936
WYCKOFF, NATHANIEL CAIN, Millstone, N. J. 1935
WYTHE, MISS MARGARET WILHELMINA, Mus. Vert. Zool., Univ. Calif., Berkeley, Calif. 1924
*YAMASHINA, MARQUIS YOSHIMARO, 49 Nanpeidai, Shibuya-machi, near Tokyo, Japan 1927
YEARLEY, CHURCH, Alpha Delta Phi Frat., 136 W. 44th St., New York, N. Y. 1935
YEARY, JOHN CY., c/o King Ranch, Kingsville, Texas 1932
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